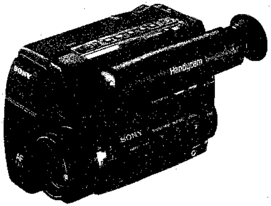
CCD-TR5

SERVICE MANUAL

US Model
Canadian Model



Handycam

FL MECHANISM

MECHANICAL ADJUSTMENT
As to the mechanical adjustment and check and parts replacement, refer to the separate "8 mm Video Mechanical Adjustment Guide Ⅱ FL mechanism (Q mechanism)".
Parts No. 9-972-705-11

U1550B# 1023011

SPECIFICATIONS

System

Video recording system	Rotary four heads, Helical scanning FM system
Audio recording system	Rotary head, FM system
Video signal	NTSC color, EIA standards
Usable cassette	8 mm video format cassette
Tape speed	SP: Approx. 1.43 cm/sec. LP: Approx. 0.72 cm/sec. (playback only)
Recording time	SP mode: 2 hours (P6 – 120)
Playback time	SP mode: 2 hours LP mode: 4 hours (P6 – 120)
Fast forward time	Approx. 8 min. (P6 – 120)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (black and white)
Lens	Combined 6 × power zoom lens f = 11 – 66 mm, F 2.0 with macro Filter diameter: 37 mm
Auto focus system	TTL
Color temperature	AUTO: HOLD INDOOR 3,200K OUTDOOR 5,800K
Minimum illumination	4 lux (F 2.0)
Illumination range	4 lux–100,000 lux
Recommended illumination	More than 300 lux
Aperture correction	Automatic

– Continued on next page –

8 VIDEO CAMERA RECORDER

SONY®

MICROFILM

Input and output connector

Video input/output	Phono jack, 1 Vp-p, 75 ohms unbalanced sync negative
Audio input/output	input: Phono jack, −7.5 dBs, input impedance more than 47 kilohms output: −7.5 dBs, (at output impedance 47 kilohms) impedance less than 2.2 kilohms
RFU DC OUT	Special minijack, DC 5 V
Earphone jack	Minijack, 8-ohm impedance
Remote jack	Stereo mini-minijack
MIC jack	Minijack, −66 dBs, low impedance with 2.5−3 V DC output, impedance 6.8 kilohms

Display in the viewfinder

Mode: STBY/REC
Caution: ▭/▣/▭/⊗/⏏
DATE/TIME, FOCUS, WHITE BALANCE,
ZERO MEM, FADER, ▨
title color, title mode,
title scroll mode, title reverse mode,
tape counter, auto focus frame, shutter speed,
recording/battery lamp

General

Power requirements	Battery compartment 6.0 V (battery pack) 7.5 V (AC power adaptor) 9.0 V (alkaline batteries)
Power consumption	5.2 W (camera recording) including the viewfinder
Installation	Vertically, horizontally
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	−20°C to +40°C (−4°F to +140°F)
Dimensions	Approx. 106 × 107 × 176 mm (w/h/d) ($4^1/_4$ × $4^1/_4$ × 7 in.)
Weight	Approx. 790 g (1 lb 12 oz) excluding the battery and cassette
Microphone	Electret condenser microphone, omni-directional monaural type

Design and specifications are subject to change without notice.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

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The color reproduction standard frame is contained after the adjustment element location of camera adjustment parts.

SERVICE NOTE

[HEAD CLEANING]

After an extended period of use the video image may become indistinct or may not appear at all during playback of a tape. The cause of this usually are dirty video heads. For remedy, cleaning of the heads is required.

Check for Head Clogs During Recording

① Use a blank tape, record a short section, then press the stop button to stop.
② Set to recording mode again.
③ If the [✱] mark is flashing in the viewfinder at this time, head clogs are occurred.

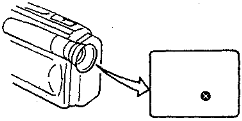
Check During Playback of a Tape

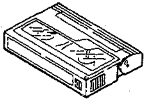
① Play back a pre-recorded tape and display the image on a TV screen.
② If there is no sound and the image is unstable, no image appears on the screen, or tape transport is unstable, head clogs are occurred.

Remedy

[Cleaning method using a cleaning tape]

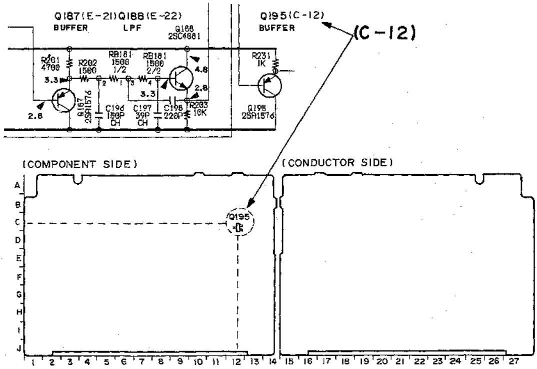
- Use the Cleaning Tape V8-6CLH. (Please follow the instructions attached to the cleaning tape.)





[SEMICONDUCTOR LOCATION]

In this service manual, the mounted locations of the semiconductors (IC, transistor, diodes) are indicated in red sa shown below. This enables to find the location on the board easily when servicing.


Q187(E-21)Q188(E-22)
BUFFER
LPF
Q188
2SC4081
Q195(C-12)
BUFFER
(C-12)
R201
4700
R202
1500
RB181
1500
1/2
RB181
1500
2/2
3.3
4.8
2.8
3.3
2.8
Q187
2SA1576
C196
150P
CH
C197
39P
CH
C198
220P
R203
10K
R231
1K
Q195
2SA1576
(COMPONENT SIDE)
(CONDUCTOR SIDE)
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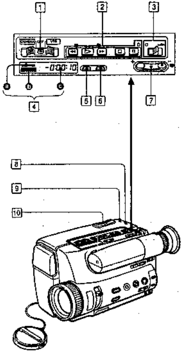
SECTION 1
GENERAL

This section is extracted from instruction manual.

A-1



Identifying the Basic Parts

For details on the use of each control, refer to the pages indicated in the circle:

A-1

1 POWER switch
CAMERA: For camera recording
VTR: For playing back or editing tapes
OFF: Power off

2 Tape transport buttons and pause indicator
▷ (playback)
▶▶ FF (fast forward)
◀◀ REW (rewind)
□ (stop)
❚❚ (pause)
During pause mode the indicator lights.

3 ● REC (recording) switch and recording indicator
Slide in the direction of the arrow for recording. During recording the indicator lights.

4 Display window
ⓐ COUNTER indicator
ⓑ ZERO MEM (memory) indicator
ⓒ Indicates the time, date or the tape counter

5 COUNTER RESET button
Press to reset the counter to zero.

6 ZERO MEM (zero memory) button
Used to memorize the counter zero point.

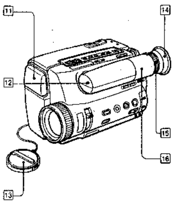
7 EDITSEARCH ⊜ button ● ●

8 Emergency lamp
Blinks when an emergency has happened.

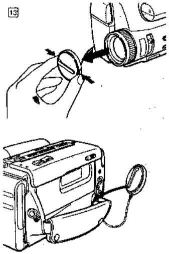
9 DEW lamp
Blinks when moisture has condensed inside the unit.

10 Power zoom button ●

A-2



A-3



A-2

11 Built-in microphone (monaural)

12 Camera recording/battery lamp
Lights during camera recording. It blinks when the battery is exhausted.

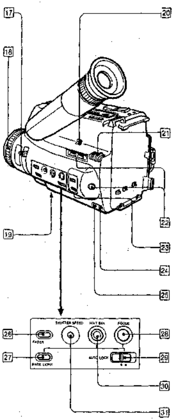
13 Lens cap
To remove the lens cap, squeeze the sides in as shown. Hook it on the grip strap so it won't be lost. A-3

14 Eyecup

15 Viewfinder lens adjustment ring ●
Adjust to your eyesight to assure good focus. Be sure to adjust this ring when shooting for the first time.

16 Viewfinder
The picture being recorded or played back can be monitored in monochrome here. Also, data such as caution indicators and function mode are displayed on the viewfinder screen.

A-4



A-4

17 **Zoom lever ● ●**
Macro set button ●

18 **Focus ring ●**

19 **Lithium battery compartment ●**

20 **EDIT switch ●**
Normally set it to the left position. When editing tapes, set to EDIT.

21 **BATT (battery eject) knob ●**

22 **Superimpose buttons ●**
MEMORY button
COLOR/MODE button
SUPERIMPOSE button

23 **DATE and TIME buttons ●**
Press to display or turn off the date or time.

24 **🎧 (earphone) jack (minijack)**

25 **REMOTE jack (stereo mini-minijack)**

26 **FADER button ●**

27 **BACK LIGHT button ●**

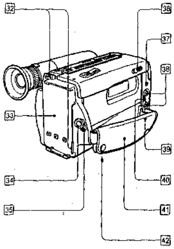
28 **FOCUS button ●**
Used for manual focusing.

29 **AUTO LOCK switch ●**
Normally set to the left AUTO LOCK position (green position).

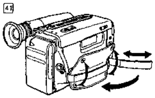
30 **WHITE BAL (white balance) buton ●**

31 **SHUTTER SPEED button ●**
Used to select the shutter speed.

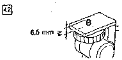
A-5



A-6



A-7



A-5

32 **Hooks for shoulder strap**
Attach a shoulder strap.

33 **Battery mounting surface**

34 **START/STOP button**
Press to start and stop camera recording.

35 **STANDBY switch**
Switch it to STANDBY to set the unit to recording pause mode.

36 **Lid lock**
Slide in the arrow direction to open the cover.

37 **MIC jack (PLUG IN POWER)**
Connect an external microphone.
The MIC jack accepts Sony "plug-in-power" microphones and supplies power to them.

38 **VIDEO/AUDIO INPUT/OUTPUT jacks (phono jacks)**

39 **INPUT/OUTPUT selector switch ●**
For INPUT → Slide to INPUT
For OUTPUT → Slide to OUTPUT

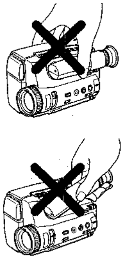
40 **RFU DC OUT (RFU adaptor DC output) jack ● (special minijack)**
Supplies power to the RFU-89UCA RFU adaptor

41 **Grip strap**
Adjust the length so that your thumb can easily manipulate the START/STOP button.
A-6

42 **Tripod receptacle**

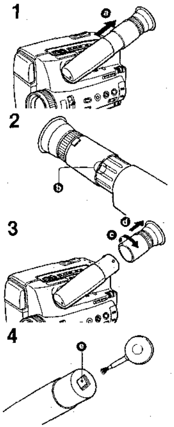
Note when attaching a tripod not manufactured by Sony
When attaching a tripod not manufactured by Sony, the length of the camera mounting screw must be less than 6.5 mm.
Otherwise the screw may damage the inner parts of the camera. A-7

A-8



Caution A-8
Do not pick up the unit as shown in the illustrations.

A-9



To remove dust from inside the viewfinder A-9

ⓐ ⓑ Pull out until the mark appears.
ⓒ Turn counterclockwise until it stops.
ⓓ Pull off.
ⓔ Clean the surface of the viewfinder screen with a blower.

Power Sources

Selection of Power Sources

This manual shows the operations on one of the following power sources.

Place		Power source	Accessory to be used
Place	Indoors	House current	AC power adaptor AC-V30 or AC-V55 (page 26)
	Outdoors	Battery pack	Battery pack NP-55 or large capacity NP-77 (page 22) Battery case EBP-55 (page 24)
	In the car	12 V or 24 V car battery	DC pack DCP-55 (page 26) (DCC-16B car battery cord supplied)

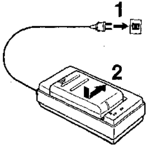
Notes on power source

- Disconnecting the power source or removing the battery pack during recording or playback may damage the inserted cassette tape. If this is done by accident, supply the power again immediately and turn on the power switch.
- Be careful not to let any metal object touched on the metal part on the battery pack or AC power adaptor. When the battery pack is not to be used, keep it in its case.

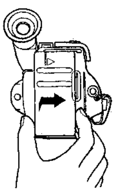
Optional Accessories for Charging

- **AC-V55 AC power adaptor**
  Two battery packs can be charged simultaneously.
- **BCA-70 or BCA-80 battery charge adaptor, ACP-88 AC pack and NPA-55 battery adaptor**
  For charging, insert an NP-55 into the NPA-55.

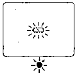
B-1



B-2



B-3



Battery Pack — NP-55 or large capacity NP-77

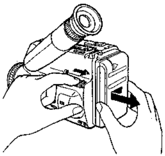
First, charge the battery pack. B-1
Use the AC-V30 AC power adaptor.
The charging time is about 1 hour for an NP-55 battery pack, or about 2 hours for an NP-77 battery pack.

1. **Connect the AC-V30 to a wall outlet.**
2. **Attach the battery pack to the AC-V30.**
   Align the grooves on the battery pack with those on the AC-V30, and while pressing the battery pack, slide it as illustrated.

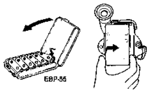
To attach the battery pack to the video camera recorder B-2
Lift up the viewfinder.
Align the right side of the battery pack with the line on the recorder, and while pressing the battery pack, slide it to the right.
Make sure that the battery is fitted completely to the mounting surface. Imperfect fit may damage the projections on the recorder.

When the battery becomes weak B-3
The ▭ indication and red lamp blink in the viewfinder. Replace the battery pack with the fully charged one.

B-4



B-5



To remove the battery pack B-4
While pressing the BATT knob in the arrow direction, slide to the left and pull out the battery pack as illustrated.

Battery life
A fully-charged NP-55 battery pack provides approximately 65 minutes of continuous camera recording, and an NP-77 provides approximately 140 minutes of continuous camera recording.

Notes
- The video camera recorder consumes power even in the recording pause mode. When recording short scenes using the recording pause mode, the battery life is less than half that of continuous recording.
  When recording is not to be started soon, turn off the power with the STANDBY switch.
- If the battery pack is not fully charged or if it is used in a cold place, its operating time is also shortened.
- If the phase between the unit and the battery pack is dart, this makes the battery life shorten.

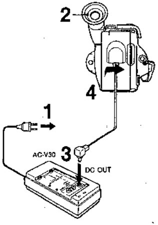
When the video camera recorder is not in use, remove the battery pack.
If the battery is installed, even if the POWER switch is set to OFF, a very small amount of electric current flows.

Battery Case EBP-55 B-5

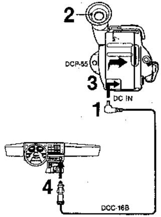
Insert the six R6 (size AA) alkaline batteries into the battery case. Connect and remove the case in the same way as the battery pack.

Notes
- Battery life — Approximately 65 min. (with new batteries, continuous recording, indoors)
- When batteries become weak, the 🪫 indication may not blink. If the cassette holder does not open, replace new batteires.
- In a cold place, the case can not work.
- Lift the viewfinder when attaching the battery case.

B-6



B-7



House Current — Using AC Power Adaptor B-6

1 **Connect the AC power adaptor to a wall outlet.**

2 **Lift up the viewfinder.**

3 **Insert the connecting cord supplied with the AC-V30 AC power adaptor into the DC OUT jack on the AC power adaptor.**

4 **Align the right side of the connecting plate with the line on the recorder, and while pressing the connecting plate, slide it to the right.**

To remove the connecting plate for the AC power adaptor from the video camera recorder
While pressing the BATT knob on the recorder, slide and pull out the connecting plate.

The optional AC-V55 AC power adaptor can also be used to operate this recorder on house current.

Car Battery — Using the DC Pack B-7

1 **Insert the DCC-16B car battery cord supplied with the DCP-55 DC pack into the DC IN jack on the DC pack.**

2 **Lift up the viewfinder.**

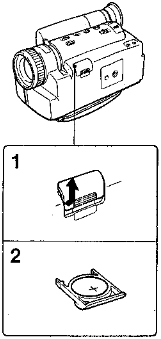
3 **Align the right side of the DC pack with the line on the recorder, and while pressing the DC pack, slide it to the right.**

4 **Connect the DCC-16B car battery cord to the cigarette lighter socket of a car (12 V or 24 V).**

To remove the DC pack from the video camera recorder
While pressing the BATT knob on the recorder, slide and pull out the DC pack.

The optional AC-V55 AC power adaptor and the DCC-16AW car battery cord can also be used to operate this recorder on a 12V or 24V car battery.

B-8



Power Sources

Lithium Battery

Why the unit needs a lithium battery
This unit uses a lithium battery to activate the clock and to keep a title in the memory. Before operating the unit for the first time, install the supplied lithium battery. B-8

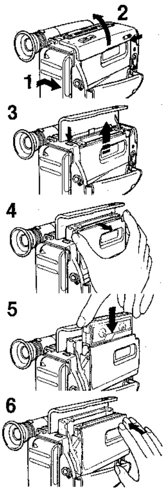
1. **To remove the lid of the lithium-battery compartment, slide it in the direction of the arrow.**
2. **Install the supplied CR2025 lithium battery with the ⊕ side facing out.**
3. **Replace the lid.**

Lithium battery life
Approximately 1 year in normal operation. When the lithium battery becomes weak, the time indication will blink on the viewfinder screen for about 5 seconds.
In this case, replace the battery with a Sony CR2025 or Duracell DL-2025 lithium battery. Use of another battery may present a risk of fire or explosion.
After replacing the battery, readjust the date and time and titles. (If the battery is replaced with the battery pack attached, the readjustments are not necessary.)

Notes on lithium battery
- Keep the lithium battery out of the reach of children.
  Should the battery be swallowed, immediately consult a doctor.
- Wipe the battery with a dry cloth to assure a good contact.
- Be sure to observe the correct polarity when installing the battery.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.
- Do not break up the battery nor throw it into a fire, which might cause it to explode. Carefully dispose of the used batteries.

WARNING
Battery may explode if mistreated.
Do not recharge, disassemble or dispose of in fire.

C-1



Cassette Care

Cassette Insertion C-1

1. **Connect a power source.**
2. **While sliding the lid lock in the direction of the arrow and lift up the lid until it clicks.**
3. **Press the EJECT button.**
   The lip of the cassette compartment will lift up.
4. **Gently pull the cassette compartment cover toward you.**
   Do not force it.
5. **Insert the cassette with the window facing out.**
6. **Press the PUSH mark on the cassette compartment cover to close it.**
7. **Close the lid.**

Cassette Ejection

1. **Make sure that a power source is connected.**
2. **While sliding the lid lock in the direction of the arrow and lift the lid up until it clicks.**
3. **Press the EJECT button.**
   The lip of the cassette compartment will lift up.
4. **Gently pull the cassette compartment cover toward you.**
   Do not force it.
5. **Take the cassette out and press the PUSH mark on the compartment to close it.**
6. **Close the lid.**

C-2

Cassette Care

To Prevent Accidental Erasure C-2

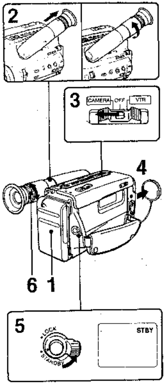
Slide out the tab on the cassette so that it covers the opening. (A red mark will appear.)

To re-record on the cassette, slide the tab in to uncover the opening.

Notes

- Don't press the upper lid of the cassette compartment forcibly when it is moving. When the cassette holder is pressed to close, the upper lid of the cassette compartment will automatically lower.
- Never insert anything in the small holes on the rear of the cassette. These holes are used to sense the kind of tape, thickness of tape, or if the tab is out or in, etc.
- To record from the beginning of the tape, run the video camera recorder for about 15 seconds at the beginning of a cassette before recording. It will avoid missing the starting point during playback on a video cassette recorder.

D



Camera Operation

Adjustment of the Position of the Viewfinder Lens

The position of the viewfinder lens for optimum vision varies depending on the user. D

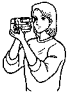
1. **Connect a power source.**
2. **Set the viewfinder.**
   Pull the viewfinder out and turn it clockwise until it clicks.
3. **While pressing the small button, set the POWER switch to CAMERA.**
4. **Remove the lens cap.**
5. **Switch the STANDBY switch to STANDBY.**
6. **Turn the viewfinder lens adjustment ring so that the indicator displayed on the viewfinder screen comes into sharp focus.**

Adjustment of the position of the viewfinder lens is necessary only for your initial use, or for use after someone else.

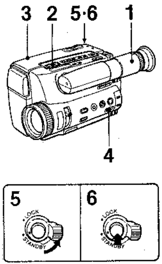
Note

- **If you leave the unit in the recording pause mode for 5 minutes or more, the unit will be automatically turned off. To resume recording pause mode, switch the STANDBY switch to LOCK once and switch it to STANDBY again.**
- For "once-only" events, it is strongly recommended to have a trial run to check that everything is working perfectly.
- PCM recording/playback is not possible with this unit. The PCM sound recorded or after-recorded with another recorder cannot be played back with this unit.

E-1



E-2



Easy Camera Recording with Automatic Adjustment

How to Record

Hold the camera recorder as in the illustration. If your nose touches the recorder, adjust the angle of the viewfinder. E-1

E-2

1 **Make sure that the viewfinder is correctly set.** (page 34).

2 **While pressing the small button, set the POWER switch to CAMERA.**

3 **Insert the cassette.**

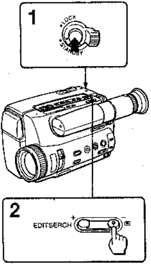
4 **Set the AUTO LOCK switch to left AUTO LOCK position. (green position)**

5 **Switch the STANDBY switch to STANDBY.**
The unit will enter the recording pause mode.
STBY: Displayed in the viewfinder during recording pause mode.

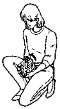
6 **Press the START/STOP button.**
Recording will start.
REC: Displayed in the viewfinder during recording.

To stop recording, press the START/STOP button.
The unit will enter the recording pause mode. Avoid rough handling or mechanical shock to the unit. A smooth transition between scenes may not be made.

E-3



E-4



E-3

To check the last portion of the previous recording

1 **Set the recorder in recording pause mode by pressing the START/STOP button.**

2 **Press the ⊖ side of the EDITSEARCH button momentarily.**

The last few seconds of the recorded portion are rewound and then the recorded picture is monitored on the viewfinder screen. The unit then enters the recording pause mode.

Note

If the picture has not been recorded
The video head may be contaminated. Clean the heads using the Sony V8-25CL video head cleaning cassette.

After using
Switch the STANDBY switch to LOCK and set the POWER switch to OFF. (You need not press the center button when setting the switch to OFF.) And put back the viewfinder.

For low position recording E-4
The viewfinder can be turned up 90 degrees.

1 **Switch the STANDBY switch to STANADBY.**

2 **Press the START/STOP button on the front.**

Easy Camera Recording with Automatic Adjustment

Note on power source
If the POWER switch is moved during recording, the tape will stop.

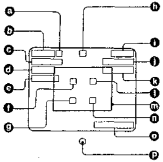
Notes on light sources
- Should you shoot a subject in bright conditions such as sunlight just after shooting in a dark place, the picture may not appear on the viewfinder screen. In this case, move the camera away from the subject to resume the normal condition.
- A vertical band may appear when a subject such as a candle flame or a light is shot against a dark background.

Notes on playback on another VCR
- To view the picture which has been recorded on this unit, set the monitor switch of the recorder for playback to the STD (standard) position.
- When recording on this unit using a tape on which PCM stereo sound has previously been recorded, set the monitor switch of the video cassette recorder for playback to the STD (standard) position. Otherwise, the sound may not be heard or may be distorted.

Notes on automatic adjustment
- During recording with auto focusing, do not turn or stop the focus ring forcibly.
- Keep the lens clean.

The camera recording with automatic adjustment may not produce optimum results under certain conditions. In this case, manually adjust the focus, white balance and iris. See pages 56, 58 and 62.

E-5



Easy Camera Recording with Automatic Adjustment

Indications inside the Viewfinder and in the Display Window E-5

ⓐ ▨ **(Back light)**
The indication lights while the BACK LIGHT button has been pressed.

ⓑ ☀ , ☼ HOLD
White balance mode (page 62)

ⓒ **Title, mode and colour** (page 82)

ⓓ **Shutter speed**

ⓔ FADER
The indication lights while the FADER button has been pressed.

ⓕ ▭
The indication blinks slowly when the battery is weak and blinks rapidly when the battery is exhausted.

ⓖ ▣ **(Dew)**
The indication blinks when moisture condensed inside the unit.

ⓗ ■
The indication lights while manual focusing. The indication blinks while auto focus function does not operate correctly, the indication blinks.

ⓘ **Tape transport mode**

ⓙ **Tape counter**

ⓚ **ZERO MEM**
The indication blinks when the ZERO MEM button is pressed.

ⓛ ▭ **(Tape end)**
The indication blinks slowly when the tape is out or close to the end. The indication blinks rapidly when the tape is at its end.

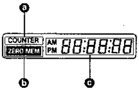
ⓜ **Auto focus frame**
This frame appears during auto focus recording.

ⓝ ⊗/⏏
The indication blinks when the unit cannot function normally.
The indication blinks when the gap of the head is clogged.
Clean the heads using the video head cleaning cassette.

ⓞ **Date or Time**

ⓟ **Camera recording/battery lamp**
The indication lights during camera recording.
It blinks when the battery is weak.

E-6



E-6

ⓐ COUNTER indicator
ⓑ ZERO MEM (memory)
ⓒ Time or tape counter

Function of the AUTO LOCK Switch

When the AUTO LOCK switch is set to AUTO LOCK (green position), the white balance, shutter speed (1/60 normal speed), and focus are adjusted automatically. The back light function does not work. But under certain circumstances, manual adjustment is better for effective recording.

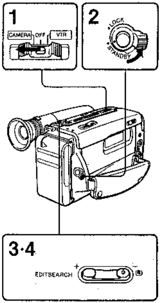
When the AUTO LOCK switch is set to the right position (white position), each manual function works as follows.

Each push of the button cyclically changes each function and the indication on the viewfinder changes.	
WHITE BALANCE See page 62.	No indication → HOLD → ☀ → ⁘ (Auto)
SHUTTER SPEED See page 66.	No indication → 100 → 250 → 1000 → 2000 → 4000 (1/60) (1/100) (1/250) (1/1000) (1/2000) (1/4000)
FOCUS See page 58.	AF frame → ■ (Manual)
BACK LIGHT See page 68.	No indication → ▨

Notes

- Just after the battery pack is attached to the recorder, even if the AUTO LOCK switch is set to the right position, the AUTO LOCK function will work.
- If the AUTO LOCK switch is set to AUTO LOCK after each function is adjusted manually, and then set to the right position again, the previous manual setting will be recalled.

E-7



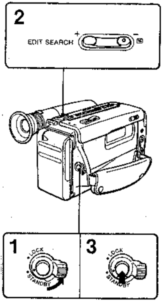
Instant Playback on the Spot E-7

You can monitor the picture just recorded on the viewfinder screen.

1. **While pressing the small button, set the POWER switch to CAMERA.**
2. **Switch the STANDBY switch to STANDBY.**
3. **Keep pressing the "−" side of the EDITSEARCH button to reverse the picture.**
4. **Keep pressing the "+" side of the EDITSEARCH button to view the playback picture.**

Note
While monitoring the picture in the viewfinder screen, the sound wil be muted.

E-8



Easy Camera Recording with Automatic Adjustment

During Recording, to Record Again on the Previous Recorded Portion E-8

Normally, smooth recording can be made even if the recording is stopped and started again, or even if the power is turned off and on again, provided that the cassette is not removed. But, if the cassette has been removed, proceed as below.

1 **Switch the STANDBY switch to STANDBY.**

2 **Locate the point from which the recording is to begin again by monitoring the picture on the viewfinder screen.**
Keep pressing the "+" side of the EDITSEARCH button to advance the picture at a normal playback speed, or the "–" side to reverse the picture.

Release the EDITSEARCH button at the desired point.
The unit will be set to recording pause mode.

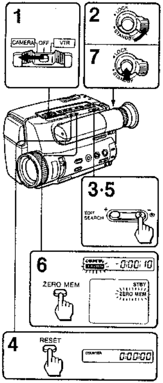
3 **Set the START/STOP button to start recording.**

To monitor the sound while viewing the playback picture on the viewfinder screen
Connect an earphone to the 🎧 jack.
1 While pressing the small button, set the POWER switch to VTR.
2 Press the ◀◀ button to rewind the tape.
3 Press the ☐ button to stop the tape.
4 Press the ▷ button to start playback.

To stop the playback, press the ☐ button.

F-1

F-2



Insert Recording 1

— Using EDITSEARCH button

F-1

You can insert (record) video and audio simultaneously from the camera onto any recorded tape.

Operation F-2

When performing insert recording, the playback picture can be monitored on the viewfinder screen.

1 **While pressing the small button, set the POWER switch to CAMERA.**

2 **Switch the STANDBY switch to STANDBY to set the unit to recording pause mode.**

3 **Keep pressing the "+" or "–" side of the EDITSEARCH button and release the button at the point where the insert should end.**
The unit will be set to recording pause mode.

4 **Display the counter in the display window and press the RESET button.**
The counter is reset to zero.
(For an accurate ending point, press the RESET button immediately after the EDITSEARCH button is released and while the still picture is displayed.)

5 **Keep pressing the "–" side of the EDITSEARCH button and release the button at the point where the insert should begin.**

6 **Press the ZERO MEM button.**
The insert ending point is stored in memory.

7 **Press the START/STOP button.**
Insert recording will begin.

The insert recording will stop automatically near the counter zero point.

Insert the Recording 1

To cancel ZERO MEM mode
Press the ZERO MEM button so that the ZERO MEM indicator disappears.

To change the insert ending point
Press the ZERO MEM button to turn off the ZERO MEM indicator and repeat steps 3 through 6 above.

To insert the date or time

1. **Follow steps 1 through 6 above.**
2. **Press the DATE or TIME button.**
   The date or time indication appears on the viewfinder screen.
3. **Press the START/STOP button.**
   The insert recording will begin.

Notes on ZERO MEM mode
ZERO MEM mode is cancelled automatically in the following cases.
- When an insert recording is completed.
- When the position of the POWER switch is changed.
- When the power is turned off.
- When the cassette is ejected.

To restore it, press the ZERO MEM button again.

Notes
- When recording pause mode lasts for approximately 5 minutes, pause mode will be automatically released and the unit will be set to stop mode.
- When the inserted tape is played back, the picture may be distorted at the end of the inserted program.

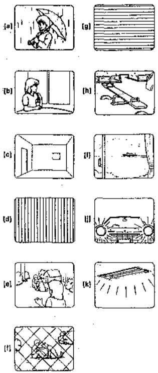
G-1

Focusing

Auto Focusing

Under most shooting condition, the Auto Focus function of this unit brings the subject into focus automatically.
The auto focus system incorporated in this unit utilizes high-precision sensors to determine picture contrast at the center of the viewfinder screen (the blue portion marked in the illustration) and adjust focus accordingly for automatic, highly accurate focusing. G-1

G-2



Manual focusing

Use manual focusing in the following conditions. G-2

[a] Insufficient light

[b] Too much bright light behind the subject

[c] Subjects with flat colors and less contrast — wall, sky, etc.

[d] Finely detailed repetitive patterns

[e] When the distance between subjects at the center is extreme (e.g. one subject is close, the other is away)

[f] Subjects beyond screens, nets, etc. or when another subject passes across the camera

[g] Horizontal stripes

[h] Diagonal object

[i] When there is frosted glass between the shooting object and the recorder

[j] Bright object or object reflecting light

[k] When shooting under a fluorescent lamp at the shutter speed set to 1/250, 1/1000, 1/2000 or 1/4000

Notes

Auto focus does not function momentarily in these cases:

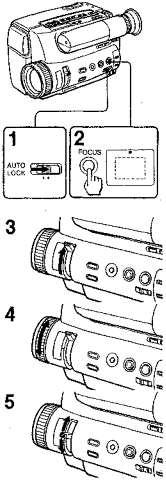
- When the shutter speed or the white balance is changed
- When the back light function is being adjusted
- When lighting conditions change quickly
- When the zooming is changed from wide-angle to telephoto

It may take several seconds to get focus when the camera is rapidly panned from a distant subject to a near subject with less contrast. In this case, adjust the focus manually.

Note on automatic adjustment

During recording with auto focusing, do not turn or stop the focus ring forcibly.

G-3



To Focus Manually G-3

1 **Set the AUTO LOCK switch to the right position.**

2 **Press the FOCUS button.**
The white mark (■) will be shown in the viewfinder and the auto focus frame will disappear.

3 **Turn the manual zoom lever to the telephoto position (66) to make the subject as large as possible in the viewfinder.**

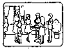
4 **Turn the focus ring to achieve sharp focus.**

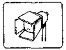
5 **Set the desired shot length using the manual zoom lever.**

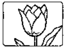
Some helpful hints

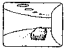
- When shooting a scene with lots of movement in bright light, the subject can be kept in good focus by setting the zoom lever to the wide-angle position and the focus ring to 2 m, regardless of the distance between the subject and the recorder.
- When shooting in low light situations such as indoors, the depth of field in proper focus is very shallow. For best results, shoot at wide angles, after focusing in telephoto.
- The figures on the focus ring indicate the distance between the subject and the lens surface.
- Recommended illumination of this unit is more than 300 lux (28 footcandles). If shooting is done indoors or under other circumstances where light is insufficient, video lights must be used for best results. Under adequate light condition, the depth of field in proper focus is wider and a sharper picture will be recorded.

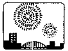
H-1


[a]


[b]


[c]


[d]


[e]

[f]

White Balance Function

Automatic White Balance Function

In most cases, the auto white balance function of this unit adjusts the white balance automatically. However, if it does not work correctly in the conditions listed below, adjust the white balance manually.

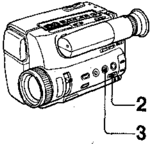
Manual White Balance Function

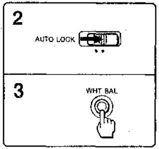
Difficult Conditions for Auto White Balance

H-1

[a]	When lighting conditions change quickly	✧
[b]	When the light source for the subject is different from that illuminating this unit, such as when the subject is in a spotlight, etc.	✧
[c]	When shooting a monochromatic subject or the background is monochromatic	HOLD
[d]	When recording under a sodium lamp	✧
	When recording under a mercury lamp	✧
	When recording under a color matching fluorescent lamp	☼
[e]	When recording outdoors, such as a night view, neon sign or fireworks	☼
[f]	When recording outdoors, such as scenes after sunset or scenes before sunrise.	☼

H-2





To Adjust the White Balance Manually

H-2

1 **While pressing the small button, set the POWER switch to CAMERA.**

2 **Set the AUTO LOCK switch to the right position.**

3 **Select the desired white balance mode by pressing the WHITE BAL button.**
Each push of the WHITE BAL button cyclically changes the indication inside the viewfinder.

No Indication (Auto) → HOLD → ☼ → ✧ → No Indication (Auto)

For the color temperature and the white balance adjustment, see page 122.

To adjust the white balance precisely

1 **While pressing the small button, set the POWER switch to CAMERA.**

2 **Switch the STANDBY switch to STANDBY.**

3 **Point the recorder to a white, flat object such as a white wall, paper, etc.**

4 **Press the WHITE BAL button to indicate the HOLD mark inside the viewfinder.**

Notes

- When the power is turned off or the light source is changed, reset the HOLD mode again.
- The white balance is related to shutter speed adjustment. When the shutter speed is adjusted manually, if the recorder is moved indoor to outdoor or vice versa, set the AUTO LOCK switch to AUTO LOCK and reset it to the right position again.
- When the recorder has been moved indoor to outdoor, or vice versa, switch the STANDBY switch to STANDBY and point the recorder to a white object for about 10 seconds so that the white balance is adjusted properly.

I-1

Shutter Speed Adjustment

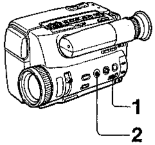
When a fast-moving subject is recorded at a normal shutter speed, the picture may not be seen clearly when played back I-1. This can be improved by increasing the shutter speed. The shutter speed of this unit can be selected from six speeds, 1/60 (normal speed), 1/100, 1/250, 1/1000, 1/2000 or 1/4000 second. However, when the shutter moves fast, it will not allow enough light to come into the lens, so the picture will be dark. Therefore, when recording at a high shutter speed, record in a brighter place than usual.

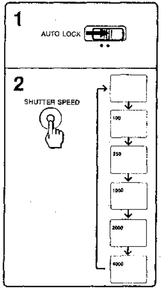
Choose an appropriate shutter speed according to the place and situation.

See the chart below for examples.

Example use	Recommended shutter speed
• On clear days, recording golf or tennis scenes (To view the hit ball clearly in the pause mode, set to 1/4000) • On clear days, recording the skiers	1/4000 or 1/2000
• On overcast days, recording a moving merry-go-round or jet-coaster • Recording outdoors from inside a vehicle (for stable shooting)	1/1000 or 1/250
• Instead of the ND2 filter (To reduce the exposure level to approx. 1/2) • Recording indoors (for stable shooting)	1/100

I-2





I-2

1 **Set the AUTO LOCK switch to the right position.**

2 **Press the SHUTTER SPEED button repeatedly until the desired shutter speed indication appears on the viewfinder screen.**

Each time the SHUTTER SPEED button is pressed, the indication changes:

No Indication → 100 → 250 → 1000 → 2000 → 4000
(1/60) (1/100)(1/250)(1/1000)(1/2000)(1/4000)

Auto focus will not function when a shutter speed other than the normal speed and 1/100 is selected under a fluorescent lamp.

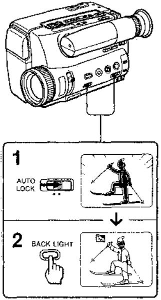
When shooting, use manual focusing.

Notes

- When shutter speed 1/250 or faster is selected, recording must be done under sunlight or video light.
- When the recording is done under a light discharged tube, such as a fluorescent lamp, sodium lamp, or mercury lamp, the brightness of the recorded picture may vary ("flicker").
- When the shutter speed is changed during a camera recording of a TV screen, the brightness of the recorded picture may vary.
- When a very bright object is shot at a faster shutter speed, a light, vertical, belt-like line ("smear") may appear on the screen.

Back Light Adjustment J

J



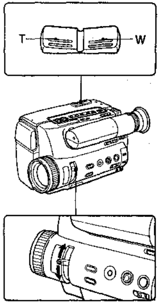
In this unit iris is automatically controlled. However, when shooting a subject that is backlit, that is the light source is coming in from the back of the subject, you should do the following steps.

1. **Set the AUTO LOCK switch to the right position.**
   The previous back light mode which is before setting the AUTO LOCK switch to the left position will be recalled.
2. **Press the BACK LIGHT button.**
   The ▧ indication appears in the viewfinder screen when the BACK LIGHT button has been pressed.

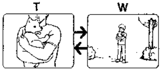
   After shooting that particular scene, be sure to press the BACK LIGHT button again to release to record. Otherwise the recorded picture will be too bright.
   The ▧ indication goes out.

Zooming

K-1



K-2



The size of the subject in the scene can be changed.

Power Zoom K-1

— for smooth and constant zooming

Press the T side of the power zoom button for telephoto and the W side for wide-angle.
The zoom lever will move automatically.

Manual Zoom K-2

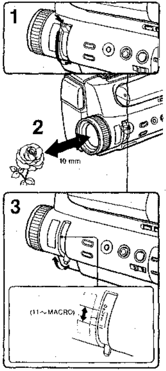
— to create a dramatic effect

Turn the manual zoom lever upward for telephoto and downward for wide-angle.

For more zooming effect

- Use an optional conversion lens (VCL-1546A or VCL-0746A) and the supplied step-up-ring. Auto focus, however will not function in that case.
- The focal length of this unit is f-11 mm to 66 mm.
  Converted into the focal length of a 35 mm camera, this means approximately 58.5 to 351 mm.

L



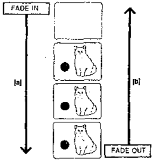
Close-ups (Macro) L

Even tiny objects can literally fill the screen for dramatic close-up effects.

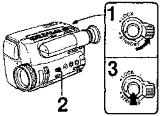
1. **Turn the zoom lever to the MACRO position, pressing the macro set button.**
2. **Bring the recorder as close as necessary to obtain the desired subject size.**
   The subject can be as close as approximately 10 mm ($^{13}/_{32}$ in.) from the lens surface.
3. **Turn the zoom lever within the MACRO range to focus sharply.** (The power zoom button can be used instead of the zoom lever.)

Notes
- Auto focusing does not function in macro shooting.
- If the subject is closer than 10 mm, it cannot be brought into focus.
- When shooting in macro, the depth of field is very shallow, so pay attention to focus. To keep the subject in focus, use a tripod or monopod.

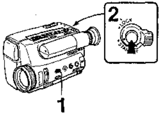
M-1



M-2



M-3



Fade-in and Fade-out Function

M-1

When fade-in, the picture and sound will gradually fade-in from a white background [a].
When fade-out, the picture and sound will gradually fade out to white. [b]
A natural beginning and ending effets can be added by using fade-in at the beginning of a recording and fade-out at the end of a recording.

How to Fade-in M-2

1. **Switch the STANDBY switch to STANDBY to set the unit to the standby mode.**
2. Press the FADER button.
3. **Press the START/STOP button.**
   Fade-in will be performed and recording will start.

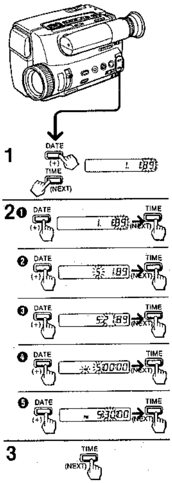
How to Fade-out M-3

1. **While recording, press the FADER button.**
2. **Press the START/STOP button.**
   Fade-out will be performed and then recording will stop.

To cancel the fade-in and fade-out function
Before pressing START/STOP button, press the FADER button again.

Note
Fade-in or fade-out is cancelled automatically after it has been performed.

N-1



Recording Date or Time

Once the date and the current time are adjusted, the date or time can be recorded together with the picture.

Before setting the date and time, make sure that power sources and lithium battery are installed.

To Set Date and Time N-1

1 **Press the DATE and TIME buttons simultaneously for more than 3 seconds.**
The date indication will appear in the display window (date/time setting mode.)
The DATE button now functions as the + button and the TIME button functions as the NEXT button.

2 **Adjust ❶ year, ❷ month, ❸ day, ❹ hour and ❺ minute in sequence, following the illustration.**
First adjust the blinking digits with the + button, and then press the NEXT button.

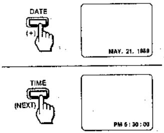
3 **Press the NEXT button at the same time with an announced time signal.**

The clock starts operating. There is no need to readjust the date and time as long as the lithium battery remains.

To clear the time indication from the display
Press the TIME (NEXT) button again.

The + button can be pressed in two ways
- When you keep the button pressed, the digits will advance continuously.
- When you press and immediately release the button, the digits will advance by one.

N-2



To check the preset date and time
Press the DATE or TIME button in the recording pause mode. When the same button is pressed again, the indication goes out.

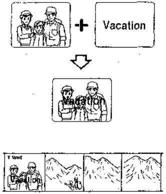
To readjust an incorrect date or time
Set the unit to date/time setting mode and press the NEXT button repeatedly until the incorrect digit blinks. Correct it with the + button and press the NEXT button. After adjusting the minute digits, press the NEXT button at the same time with an announced time signal.

To Record the Date or Time N-2

During camera recording or in recording pause mode, press the DATE or TIME button to display the date or time on the viewfinder screen.
The date or time being displayed will be recorded together with the picture.

To stop recording the date or time
Press the DATE or TIME button again. The picture recording will continue.

O-1



Recording a Title

Before recording, memorize a title or figure. The memorized title or figure is superimposed onto the picture being recorded. O-1

- One title or figure can be memorized.
- The color of the title or figure can be selected from 8 colors.

Make sure that the lithium battery is installed. See page 28.

Preparations

To make a desired title card

- Use a white and plane card and draw the title on it with a deep color (black is recommended for the best result) in thick letters.
  If contrast is clear, a signboard can be memorized like the title card.
- When deciding the title size, check the effective picture size on your video monitor.

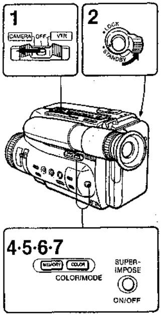
Before memorizing the title

- Fix the title card and the video camera recorder.
- Use of an appropriate light is recommended for a better result.

Function of the COLOR/MODE button
This button is used to select the title color or title mode.

When the title is displayd	When the title is not displayed
Used as the COLOR button.	Used as the MODE button.
WHT → BLUE → GRN → CYAN (white) (green) BLK ← YEL ← VIO ← RED (black) (yellow) (violet)	No title mode ↑ → ▮ → ▮↑ ↑: title scroll mode ▮ : title reverse mode ▮↑: title reverse and scroll mode
Each push of the COLOR/MODE button cyclically changes the color or mode.	

O-2



To Memorize the Title O-2

1 While pressing the small button, set the POWER switch to CAMERA.

2 Switch the STANDBY switch to STANDBY to set the unit in the recording pause mode.

3 Point the camera to the title card and adjust the focus.

4 Press the SUPERIMPOSE button.

5 Press the MEMORY button to memorize the title.

6 Select the title color while observing the color indication in the viewfinder. Each push on the COLOR/MODE button cyclically changes the color, as follows:

WHT (white) → BLUE → GRN (green) → CYAN
↑ ↓
BLK (black) ← YEL (yellow) ← VIO (violet) ← RED

7 Press the SUPERIMPOSE button to turn off the title.

Notes

- The color indication in the viewfinder is not recorded on the tapes.
- You can change the title color even after starting the recording.

To check the title
To check the memorized title, press the SUPER IMPOSE button. To turn off the title, press the button again.

To Record the Title

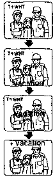
To record the title from the beginning
Press the SUPERIMPOSE button in recording pause mode, and then start recording.

To record during camera recording
Press the SUPERIMOSE button at the point from which the title is to be inserted.
The memorized title will be recorded together with the picture.

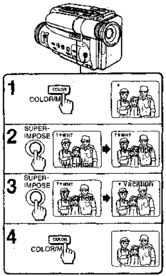
To stop recording the title
Press the SUPERIMPOSE button again. The picture recording will continue.

To record the same title several times
By repeating the above procedure, you can record the title as many times as desired.

O-3


T+WHT
Vacation
Vacation
• Vacation

O-4


1
COLOR
COLOR/M
2
SUPER-
IMPOSE
T+WHT
Vacation
3
SUPER-
IMPOSE
T+WHT
• Vacation
4
COLOR
COLOR/M

To Scroll the Title from Bottom to Top

During recording, the memorized title can be scrolled from bottom to top. O-3

To check the scrolled title O-4

1. **In the recording pause mode, press the COLOR/MODE button.**
   The arrow mark will be displayed.
2. **Press the SUPERIMPOSE button.**
   The title will be displayed from bottom to center.
3. **Press the SUPERIMPOSE button again.**
   The title will be displayed from center to top.
4. **Press the COLOR/MODE button three times.**
   The arrow mark will disappear.

To record the scrolled title

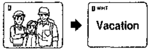
1. **In the recording pause mode, press the COLOR/MODE button.**
   The arrow mark will be displayed.
2. **Start the camera recording.**
3. **Press the SUPERIMPOSE button at the point from which the scrolled title is to be recorded.**
4. **After the title stops at the centre of the picture, press the SUPERIMPOSE button again.**
   The title is scrolled from centre to top.

To clear the scroll mode
After recording, press the COLOR/MODE button **three times.**

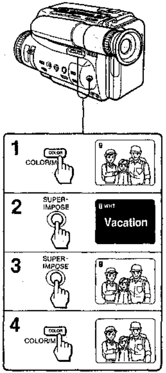
If you do not want to record the picture for the background
Point the recorder to a white, flat object such as a white wall, paper, etc.

To change the color of the title
While the title is being scrolled or displayed at the center, press the COLOR/MODE button.

O-5


WHT
Vacation

O-6


1
COLOR
COLOR/M
2
SUPER-
IMPOSE
WHT
Vacation
3
SUPER-
IMPOSE
4
COLOR
COLOR/M

To Reverse the Title and the Background

The color scheme of the title and the background can be reversed. O-5

To check the reversed picture O-6

1. **In the recording pause mode, press the COLOR/MODE button twice.**
   The ■ mark will be displayed.
2. **Press the SUPERIMPOSE button.**
   The reversed title and background will be displayed.
3. **Press the SUPERIMPOSE button again.**
4. **Press the COLOR/MODE button twice.**
   The ■ mark will disappear.

Recording a Title

To record the reversed picture from the beginning

1. **In the recording pause mode, press the COLOR/MODE button twice.**
   The T mark will be displayed.
2. **Press the SUPERIMPOSE button.**
3. **Start the camera recording.**
4. **Press the SUPERIMPOSE button again to clear the reversed picture.**

To record the reversed picture during recording

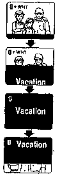
1. **In the recording pause mode, press the COLOR/MODE button twice.**
   The T mark will be displayed.
2. **Start the camera recording.**
3. **Press the SUPERIMPOSE button at the point from which the reversed picture is to be recorded.**
4. **Press the SUPERIMPOSE button again to clear the reversed picture.**

To clear the reverse mode
After recording, press the COLOR/MODE button twice.

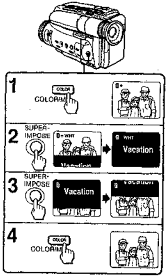
If you do not want to record the picture for the background
Point the recorder to a white, flat object such as a white wall, paper, etc.

To change the color of the background
While the title is being displayed, press the COLOR/MODE button.

O-7



O-8



Recording a Title

To Scroll the Reversed Title O-7

To check that the reversed title is scrolled O-8

1. **In the recording pause mode, press the COLOR/MODE button three times.**
   The arrow mark and the T mark will be displayed.
2. **Press the SUPERIMPOSE button.**
   The reversed picture will be displayed from bottom to centre.
3. **Press the SUPERIMPOSE button again.**
   The title will be displayed from center to top.
4. **Press the COLOR/MODE button once.**
   The marks will disappear.

To record the reversed and scrolled title

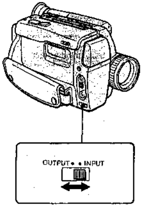
1. **In the recording pause mode, press the COLOR/MODE button three times.**
   The arrow mark and the T mark will be displayed.
2. **Start the camera recording.**
3. **Press the SUPERIMPOSE button at the point from which the reversed and scrolled title is to be recorded.**
4. **After the reversed title stops at the centre of the picture, press the SUPERIMPOSE button again.**
   The reversed title is scrolled from centre to top.

To clear the reversed scroll mode
After recording, press the COLOR/MODE button once.

If you do not want to record the picture for the background
Point the recorder to a white, flat object such as a white wall, paper, etc.

To change the color of the background
While the title is being displayed, press the COLOR/MODE button.

P-1



VTR Operation

Preparation for Playback

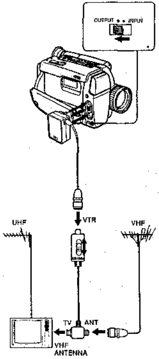
When the VCR is connected to the TV, refer to pages 104 and 106.

About the AUDIO/VIDEO Jacks P-1

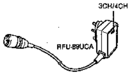
The Audio/Video jacks work as both input jacks and output jacks. Set the INPUT/OUTPUT selector switch as follows.

to OUTPUT position	to view playback tape
to INPUT position	to record from TV or other tape

P-2



P-3



Connecting a TV

Connecting a TV without audio/video input connectors P-2

1 **Connect the RFU adaptor to the CCD-TR5.**

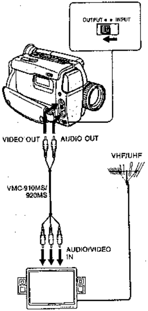
2 Select **OUTPUT** with the INPUT/OUTPUT selector switch.

3 **Connect the VHF antenna, CCD-TR5 and TV to the antenna selector** (supplied with the RFU-89UCA).
Use a 75-ohm coaxial cable for antenna connection.

4 **Set the selector switch on the antenna selector as follows:**
For viewing a playback picture → VTR
For viewing TV programs → ANT

On the TV channel for the video camera recorder P-3
When you view the playback picture, set the channel selector of the RFU adaptor to either VHF channel 3 CH or 4 CH and select the same channel on the TV.

P-4



Preparation for Playback

Connecting a TV (or color monitor) equipped with audio/video input connectors P-4

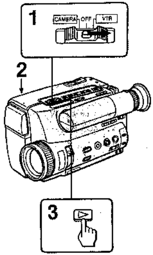
Leave the TV antenna cable connected to the TV.

1 **Connect the CCD-TR5 to the TV using the optional VMC-910MS/920MS audio/video cable.**

2 **Select OUTPUT** with the INPUT/OUTPUT selector switch.

3 **Set the TV/VIDEO selector button on the TV as follows.**
For viewing a playback picture → VIDEO
For viewing TV programs → TV

Q-1



Playback

Turn on the TV (or color monitor), and select the channel for viewing a playback picture (or set the TV/VIDEO selector to VIDEO).

Q-1

1 **While pressing the small button, set the POWER switch to VTR.**

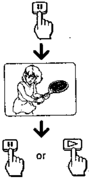
2 **Insert a cassette.**

3 **Press the ▷ button.**
Playback will start.

To stop the tape, press the □ button.

After using, be sure to set the POWER switch on the recorder to OFF.

Q-2



To view a still picture Q-2
Press the ❚❚ button during playback. To resume playback, press the ❚❚ button again or press the ▷ button.

Monitoring a High-Speed Picture

During playback — Picture search

1 **In the playback mode, press the ◀◀ or ▶▶ button.**
The picture will be monitored at high speed as long as it is kept pressed.

2 **Release the ◀◀ or ▶▶ button at the desired point.**
Normal playback will resume.

During fast-forward or rewind — Skip scan

1 **Press the ▶▶ button in fast-forward mode or press the ◀◀ button in rewind mode.**
The picture is displayed while the button is kept pressed.

2 **Release the ▶▶ or ◀◀ button to resume normal fast-forward or rewind mode.**

Notes

- If you move the position of the POWER switch during playback, the tape will stop. When you move the POWER switch to CAMERA in the playback pause mode, however, the unit will enter recording pause mode.
- When the pause mode lasts for 5 minutes or more, the unit will automatically enter the stop mode.
- Streaks will appear and the sound will be muted in the high-speed picture.

TV Program Recording

The following connections make both TV program viewing and recording possible.

Combination of the Equipment to be Used

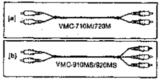
Connection example 1 (page 104)
To connect the VCR without input selector

Connection example 2 (page 106)
To connect the TV tuner and color monitor or TV with audio/video input and output jacks

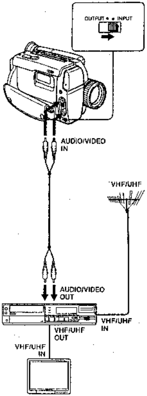
Connecting Cables R-1

- For antenna cable connections, use 75-ohm coaxial cables.
- For video/audio connection, use an optional audio/video cable to match the connectors on the equipment to be connected.
  - [a] Optional VMC-710M/720M for monaural equipment
  - [b] Optional VMC-910MS/920MS for stereo equipment ·

R-1



R-2


OUTPUT • • INPUT
AUDIO/VIDEO IN
VHF/UHF
AUDIO/VIDEO OUT
VHF/UHF IN
VHF/UHF OUT
VHF/UHF IN

Connection Example 1

To connect the VCR with an input selector R-2

Connections

Connect the equipments as shown in the illustration.
Make sure that the INPUT/OUTPUT selector switch is set to **INPUT**.

TV program recordings

1 **Turn on the VCR and TV.**

2 **While pressing the small button, set the POWER switch on the CCD-TR5 to VTR.**

3 **Select the channel for the VCR on the TV.**

4 **Set the input selector to TUNER, the TV/VTR select button to VTR and select the TV channel to be recorded on the VCR.**

5 **Insert a cassette into the CCD-TR5 and slide the ● REC switch.**
Recording will start.

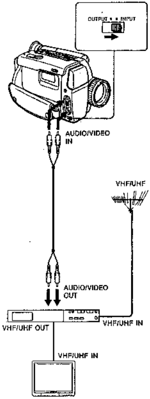
To view another TV program while recording

Set the TV/VTR select button on the VCR to TV and select the desired program on the TV.

Playback

See "VTR Operation" on page 92.

R-3


OUTPUT • • INPUT
AUDIO/VIDEO IN
VHF/UHF
AUDIO/VIDEO OUT
VHF/UHF OUT
VHF/UHF IN
VHF/UHF IN

Connection Example 2

To connect the TV tuner and color monitor or TV with audio/video input and ouput jacks R-3

Connections

Connect the equipments as shown in the illustration.
Make sure that the INPUT/OUTPUT selector switch is set to **INPUT**.

TV program recording

1 **Turn on the TV tuner or TV.**

2 **While pressing the small button, set the POWER switch on the CCD-TR5 to VTR.**

3 **Set the input selector on the TV tuner or TV to TV and select the TV channel to be recorded.**

4 **Insert a cassette into the CCD-TR5 and slide the ● REC switch.**
Recoring will start.

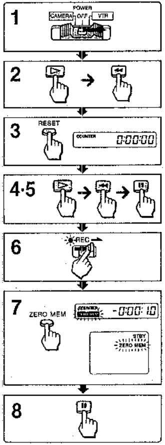
Playback

See "VTR Operation" on page 92.

Insert Recording 2

To Insert a TV Program or a Picture from Another VCR S

S



Monitor the picture being inserted on the viewfinder screen.

1 **While pressing the small button, set the POWER switch to VTR.**

2 **Locate the point on the tape where the insert should end by pressing the ◀◀ or ▶▶ button during playback.**

3 **Display the counter in the display window and press the COUNTER RESET button.**
The counter is reset to zero.

4 **Press the ◀◀ button during playback to rewind the tape a little further than the point where the insert should begin.**

5 **Release the ◀◀ button to resume playback and press the ❚❚ button at the insert starting point.**
The pause lamp lights.

6 **Slide the ● REC switch in the arrow direction to set the unit to recording pause mode.**
The recording lamp lights.

7 **Press the ZERO MEM button.**
The insert ending point is stored in memory.

8 **To start recording, press the ❚❚ button.**

The insert recording will stop automatically near the counter zero point.

To cancel ZERO MEM mode
Press the ZERO MEM button so that the ZERO MEM indicator disappears.

Use of the Tape Counter

During recording or playback, the digits on the counter indicate the actual recording or playback time.

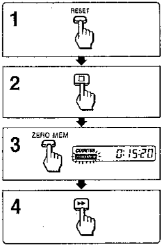
To Index the Whole Tape

Press the RESET button at the beginning of the tape so that the counter shows "0:00:00". By noting the counter reading at a particular point, you can easily find that point later by referring to the tape counter.

Notes
- The counter reading and the point of the tape may not correspond exactly. Use the counter as a guide.
- The counter does not operate for a blank, unrecorded portion of a tape.
- There will be a time lag of several seconds on the counter reading after repeated fast-forward and rewind operations.
- There will be also a time lag of several seconds when the tape recorded in LP and SP modes mixed or the tape having a blank portion between the recorded portions is played back.

To Return to a Pre-registered Point T

T



1 **During recording or playback, press the RESET button at the point you later want to locate.**

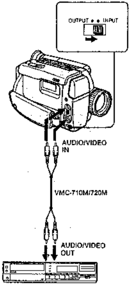
2 **Press the ☐ button when the recording or playback has finished.**

3 **Press the ZERO MEM button.** The "ZERO MEM" indicator will blink in the display window.

4 **Press the ▶▶ or ◀◀ button.**
The tape will be rewound or sent forward and stop automatically when the counter reaches approximately zero.

Notes
- The ZERO MEM button does not function during recording or playback mode.
- Be sure to press the ZERO MEM button when the tape is stopped.
- The ZERO MEM mode is cancelled automatically once the tape is rewound or sent forward to zero.

U-1



Tape Editing

To edit a home movie tape, you will need another VCR or another video camera recorder.

To Edit from Another VCR to the CCD-TR5 U-1

1 **Make sure the INPUT/OUTPUT selector switch is set to INPUT.**

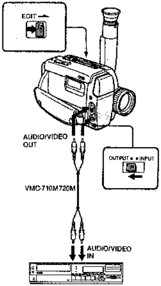
2 **While pressing the small button, set the POWER switch on the CCD-TR5 to VTR.**

3 **Start playback on another VCR.**

4 **Slide the ● REC switch on the CCD-TR5.**

When the VCR to be used is a stereo type, use the VMC-910MS/920MS connecting cable.

U-2



To Edit from the CCD-TR5 to Another VCR U-2

1 **Make sure the INPUT/OUTPUT selector switch is set to OUTPUT.**

2 **While pressing the small button, set the POWER switch on the CCD-TR5 to VTR and turn on the other VCR.**

3 **Slide the EDIT switch on the CCD-TR5 in the direction of the arrow (ON).**

4 **Set the input selector on the VCR to LINE.**

5 **Press the ❚❚ button on the CCD-TR5 during playback at the point where you want to start recording.**

6 **Press the record button on the other VCR, pressing the ❚❚ button.**

7 **Release the ❚❚ buttons on both units simultaneously.**
Recording will start.

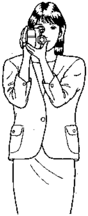
When the VCR to be used is a stereo type, use the VMC-910MS/920MS connecting cord.

After editing, turn off both units and be sure to slide the EDIT switch in the reversed direction to the arrow (OFF).

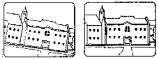
To cut off an unnecessary portion
Press the ❚❚ button on the recorder at the beginning of the unnecessary portion.
Release it where you want to resume recording.

Function of the EDIT switch
Slide this switch in the direction of the arrow (ON) whenever you edit tapes. Signal loss that results from tape-to-tape transfer will be reduced, achieving more accurate signal transfer.
When recording or playing back normally, keep this switch in the reversed direction to the arrow (OFF).

A



B



Hints for Better shooting

Basic Camerawork

Getting stable pictures A

For hand-held shots, holding the recorder properly is the key.

- Hold the recorder firmly and secure it with the grip strap so that it is easy to manipulate the recorder with your thumb.
- Breathe gently.
- Place your right elbow firmly against your side.
- Stand opposite to the subject and plant your feet firmly in a comfortable position.
- Place your eye firmly against the viewfinder eyecup.
- Try to keep both eyes open.
- Place your left hand under the camera recorder to support it. When adjusting the focus manually, make sure the unit does not move.

Use a tripod or monopod if possible

If you have a tripod for your still camera, it can also be used with the video camera recorder. Use a sturdy one.
If a tripod is not available, try placing the camera on a tabletop, wall, or any other flat surface of suitable height.

Keeping the horizontal plane level

Even if camera work is smooth and stable, shots can be tilted or off axis horizontally.

The horizontal plane can be easily determined by using the viewfinder frame as a reference. B

Lighting

Try to shoot scenes with the sun at your back

When shooting a scene when the light source is in back of the subject, the subject will be recorded too dark and the background too light.

The followings are also backlight conditions:

- The subject is indoors and there is a window behind the subject.
- Bright sources such as fluorescent or incandescent lamps are included in the scene.
- A person wearing white or glossy clothes in front of a white background. In this case, the face will be recorded too dark.

For the sharpest pictures, you need the best light

For the most brilliant color in your scenes, a sufficient light level must be maintained. If shooting is done indoors or under other circumstances where light is insufficient, lights must be used for best results.

What kind of light is best? Choosing the right lights

Photography lamps or halogen lamps are recommended. For best results, use of the Sony video lights are recommended as their weight and low heat output levels allow safe, direct connection to the camera.
For lighting of a wide area for easy use—reflector flood light
To emphasize the subject—use a reflector spotlight.
When using a video light, attach it to the unit with the optional video light attachment.

Hints for Better Shooting

Precautions for using lights

Do not point the light at the recorder body. Instead, make sure that it is pointed parallel to the camera or away from it. Be especially careful with lights. The high heat from the lights pointed at the camera body can warp the cabinet.

For detailed instructions on proper use of lights, carefully read the instruction manuals that accompany them.

Understanding Light and Color

Brightness Levels

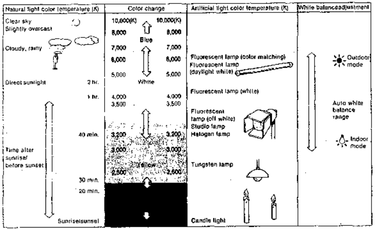
The single greatest influence on picture quality is the brightness level. Using the following chart as a reference, take a few minutes to familiarize yourself with brightness levels to improve your recording.

ND filter required	Unit: lux	Snow-covered mountains Snow fields Sandy beach, clear day in summer
Normal recording	100,000	Clear day, mid-day (100,000) Clear day, mid-afternoon (35,000) Overcast day, mid-day (32,000)
	10,000	Overcast day, one hour after sunrise (2,000)
	1,000	Office lit by fluorescent lamps, near window (1,000) Clear day, one hour before sunset (1,000) Department store counter (500~700)
	500	Station wicket (650) Office lit by fluorescent lamps (400–500) Room lit by two 30 W fluorescent lamps (300)
Video light recommended	300	Subway station platform (300)
Video light required	100	Arcade at night (150–200) Theater lobby (15–35) Candle light (10–15)
	10	

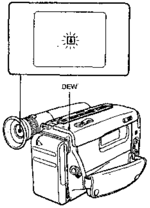
Hints for Better Shooting

Color temperature — how it affects white balance adjustment

If the temperature of an object continues to increase, it will eventually begin giving off light. At this time, there is a fixed relationship between the object's temperature and its "light color." The temperature of the object radiating the light is expressed in absolute temperature (K). This is also known as the color temperature, which in turn stands for "light color." As color temperature increases, the light color changes from red to yellow to white to blue.


Natural light color temperature (K)
Color change
Artificial light color temperature (K)
White balanceadjustment
Clear sky
Slightly overcast
Cloudy, rainy
Direct sunlight
2 hr.
1 hr.
40 min.
Time after sunrise/ before sunset
30 min.
20 min.
Sunrise/sunset
10,000(K)
8,000
Blue
7,000
6,000
5,000
White
4,000
3,500
3,200
3,000
Yellow
2,500
10,000(K)
8,000
7,000
6,000
5,000
4,000
3,500
3,200
3,000
2,600
Fluorescent lamp (color matching)
Fluorescent lamp (daylight white)
Fluorescent lamp (white)
Fluorescent lamp (off white)
Studio lamp
Halogen lamp
Tungsten lamp
Candle light
Outdoor mode
Auto white balance range
Indoor mode

V-1



V-2

Notes on Moisture Condensation

If the unit is brought directly from a cold to a warm location, moisture may condense inside the unit, on the surface or the tape or on the lens. In this condition, the tape may adhere to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the unit is furnished with moisture sensors.

Moisture is present inside the unit when: V-1

- The 💧 indicator blinks inside the viewfinder.
- The DEW lamp blinks on the recorder.

No function except for cassette ejection will work.

⬇

Eject the cassette if present, and turn off the unit and leave it with the cassette holder open at least for one hour.

⬇

The unit can be used again if the 💧 indicator does not appear when the power is turned on again.

If moisture is present on the surface of the tape V-2

When the tape is inserted and a tape transport button is pressed, the ⏏ indicator blinks inside the viewfiner. No function except for cassette ejection will work.

⬇

Eject the cassette and let the unit and the cassette sit at least for one hour.
The cassette can be used again if the ⏏ indicator does not appear when the cassette is inserted and a tape transport button is pressed.

If moisture condensation occurs on the lens
There are no caution indicators, but the lens becomes dim. Turn off the power and leave the unit unused at least for one hour.

Precautions

Operation

- Operate the unit on 6.0 V (battery pack), 7.5 V (AC power adaptor), 9.0 V (alkaline batteris with the EBP-55).
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Do not hold the unit by the viewfinder.
- Avoid rough handling or mechanical shock to the unit. Be particularly careful of the lens.
- Do not apply excessive force to the microphone.
- Avoid shooting the same object for a long period of time (for example, using as a lookout camera or pointing the camera directly at the sun or other bright light sources) as this will damage the color filter inside the camera and may cause a poor picture quality.
- Remove and store video cassettes after recording or playback.
- Do not wrap up the unit and operate it because heat may build up internally.
- Avoid using and storing the recorder in the following locations.
  - — Locations susceptible to vibration.
  - — Locations exposed to strong magnetic fields.
  - — Locations near TV or radio transmitters where strong radio waves are generated.
- Do not put the unit on the sand.

Care

- Store cassettes in their cases and keep them in an upright position to prevent intrusion of dust and uneven winding.
- When the unit will not be used for a long period of time, periodically turn on the power, operate the camera section and recorder section and play back a tape for about three minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on them, remove them with a soft cloth. Clean the recorder body with a dry, soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.
  For protection, keep the lens cap on the lens when not using the camera.

Using Your Recorder Abroad

Each country has special TV color broadcast and electricity systems. Before using your recorder abroad, check the following points.

Differences in color systems
If you prepare fully charged battery packs and the AC power adaptor which can be used in all areas with the local power supply of 100V–240V, you can use your recorder in any country. You can monitor the playback picture on the viewfinder screen. However, to monitor the playback picture on a TV, the TV must be based on the NTSC system and have the video/audio inputs.

NTSC system countries
Bahama Islands, Canada, Central America, Japan, Korea, Mexico, Taiwan, the Philippines, U.S.A., etc.

PAL system countries
Australia, Austria, Belgium, China, Denmark, Finland, Great Britain, Holland, Hong Kong, Italy, Kuwait, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, West Germany, etc.

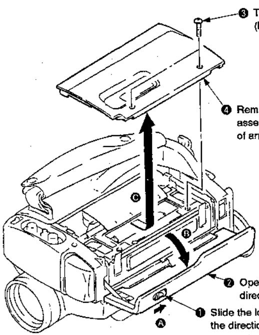
SECAM system countries
Bulgaria, France, Hungary, Iran, Iraq, Monaco, Poland, the Soviet Union, etc.

Differences in cassette tapes
There are two formats for 8 mm video redording, NTSC and PAL. Video cassette tapes are made to correspond to the respective fomats. Use NTSC format cassette tape for the CCD-TR5. You will find "P6" on the package of the cassette. In some countries, however, only PAL format cassette tape with "P5" on the package is available. In this case, the standard recording times stipulated on the cassette are different from the actual recording time.

For your reference to the recording times NTSC and PAL format cassettes, see page 140.

SECTION 2
DISASSEMBLY

2-1. REMOVAL OF CASSETTE LID ASSEMBLY



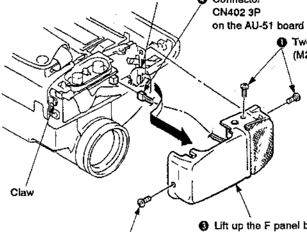
❸ Two screws (P1.4 × 5)

❹ Remove the cassette lid assembly in the direction of arrow Ⓒ.

❷ Open the grip lid in the direction of arrow Ⓑ.

❶ Slide the lock button in the direction of arrow Ⓐ.

2-2. REMOVAL OF F PANEL BLOCK ASSEMBLY



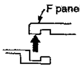
❹ Connector CN402 3P on the AU-51 board

❶ Two screws (M2 × 4)

❷ Screw (M2 × 4)

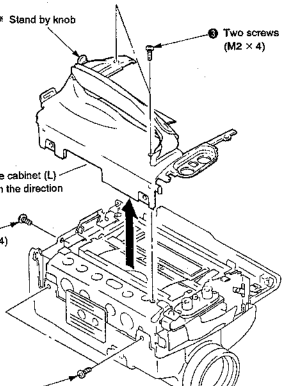
❸ Lift up the F panel block assembly a little and remove it in the direction of arrow. (Pay attention to the claw.)

Details for Section Ⓐ



Remove F panel block assembly in the direction of the arrow from the concave portion of the main unit.

2-3. REMOVAL OF CABINET (L) ASSEMBLY



※ Stand by knob

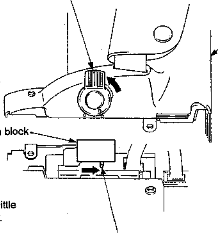
❸ Two screws (M2 × 4)

❹ Remove the cabinet (L) assembly in the direction of arrow.

❷ Screw (M2 × 4)

❶ Two screws (M2 × 4)

Note on installing the cabinet (L) assembly



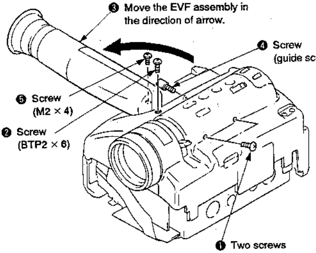
Set the stand by knob to "STAND BY" position.

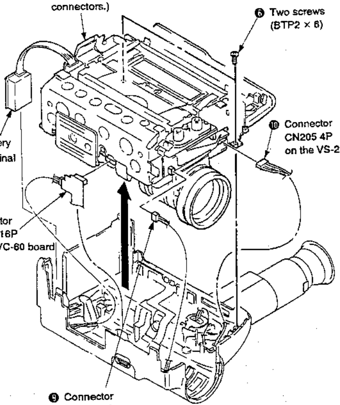
Cabinet (L) assembly

FK-9 switch block

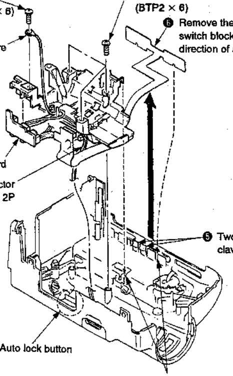
Slide the lock lever below the switch rightward.

2-4. REMOVAL OF VTR AND CAMERA BLOCKS


③ Move the EVF assembly in the direction of arrow.
④ Screw (guide screw)
⑤ Screw (M2 × 4)
② Screw (BTP2 × 6)
① Two screws (BTP2 × 6) (Note: It is set slantwise.)

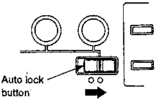

⑦ Lift up the VTR and camera blocks in the direction of arrow. (Note: In this state, remove respective connectors.)
⑥ Two screws (BTP2 × 6)
Battery terminal
⑩ Connector CN205 4P on the VS-22 board
⑧ Connector CN804 16P on the VC-60 board
⑨ Connector CN403 2P on the AU-51 board

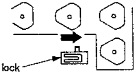
2-5. REMOVAL OF CF-4 SWITCH BLOCK


② Screw (BTP2 × 6)
① Three screws (BTP2 × 6)
⑥ Remove the CF-4 switch block in the direction of arrow.
③ GND wire
⑦ EL-1 board
④ Connector CN753 2P
⑤ Two claws
＊ Auto lock button
＊ Positioning for installing

Note on installing CF-4 switch block

Set the auto lock button on the cabinet (R) block assembly to the rear (battery side) position.

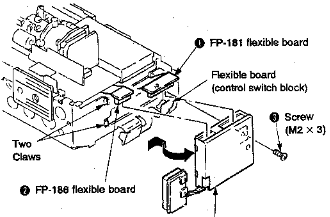

Cabinet (R) block assembly
Auto lock button


CF-4 switch block
Auto lock switch

Set the auto lock switch on the CF-4 switch block to the position indicated in the figure.

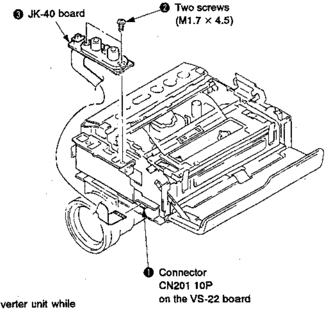
2-6. REMOVAL OF DC-DC CONVERTER UNIT

Note: Be sure to prevent the flexible board of the control switch block from being damaged when removing the DC-DC converter unit.

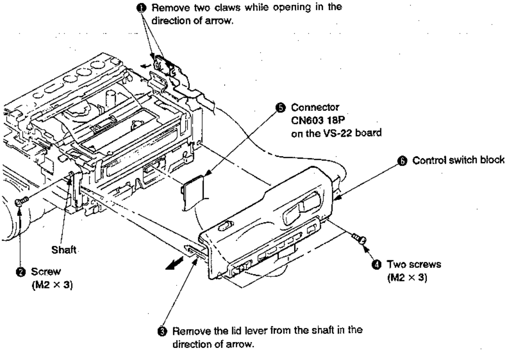

❶ FP-181 flexible board
Flexible board
(control switch block)
❸ Screw
(M2 × 3)
Two
Claws
❷ FP-186 flexible board

❹ Remove the DC-DC converter unit while releasing the two claws in the direction of arrow.

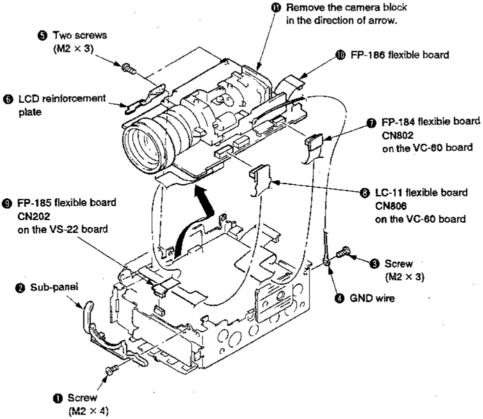
2-7. REMOVAL OF THE JK-40 BOARD


❸ JK-40 board
❷ Two screws
(M1.7 × 4.5)
❶ Connector
CN201 10P
on the VS-22 board

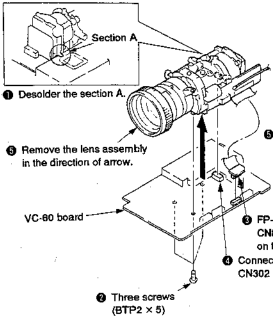
2-8. REMOVAL OF CONTROL SWITCH BLOCK


❶ Remove two claws while opening in the direction of arrow.
❺ Connector
CN603 18P
on the VS-22 board
❻ Control switch block
Shaft
❷ Screw
(M2 × 3)
❹ Two screws
(M2 × 3)
❸ Remove the lid lever from the shaft in the direction of arrow.

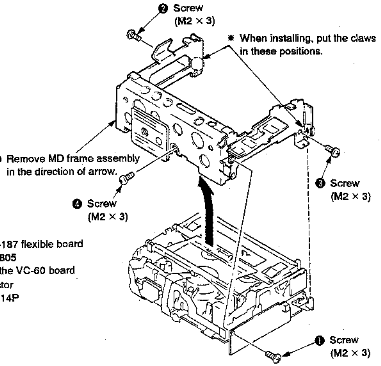
2-9. REMOVAL OF CAMERA BLOCK


⑪ Remove the camera block
in the direction of arrow.
⑤ Two screws
(M2 × 3)
⑩ FP-186 flexible board
⑥ LCD reinforcement
plate
⑦ FP-184 flexible board
CN802
on the VC-60 board
⑧ LC-11 flexible board
CN806
on the VC-60 board
⑨ FP-185 flexible board
CN202
on the VS-22 board
③ Screw
(M2 × 3)
② Sub-panel
④ GND wire
① Screw
(M2 × 4)

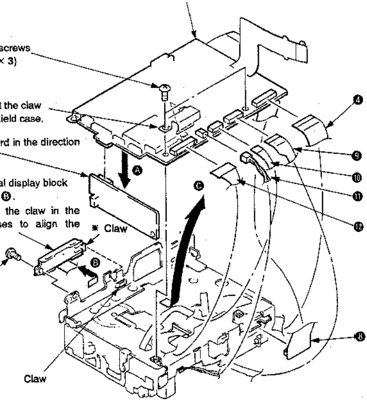
2-10. REMOVAL OF LENS ASSEMBLY


Section A
① Desolder the section A.
⑤ Remove the lens assembly
in the direction of arrow.
VC-60 board
③ FP-187 flexible board
CN805
on the VC-60 board
④ Connector
CN302 14P
② Three screws
(BTP2 × 5)

2-11. REMOVAL OF MD FRAME ASSEMBLY


② Screw
(M2 × 3)
* When installing, put the claws
in these positions.
⑤ Remove MD frame assembly
in the direction of arrow.
④ Screw
(M2 × 3)
③ Screw
(M2 × 3)
① Screw
(M2 × 3)

2-12. REMOVAL OF VS-22 BOARD



① Remove the AU-51 board in the direction of arrow Ⓐ.

② Screw
(M2 × 3)

③ Remove the liquid crystal display block in the direction of arrow Ⓑ.
✱ When installing, put the claw in the notch on the chaises to align the position.

④ FP-149 flexible board

⑤ Two screws
(M2 × 3)

⑥ RP connector shield
✱ When installing, put the claw in the hole in the shield case.

⑦ Remove the VS-22 board from the claw and open it in the direction of arrow Ⓒ.

⑧ FP-182 flexible board

⑨ DL-18 flexible board

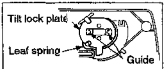
⑩ FP-114 flexible board

⑪ Connector
CN607 2P

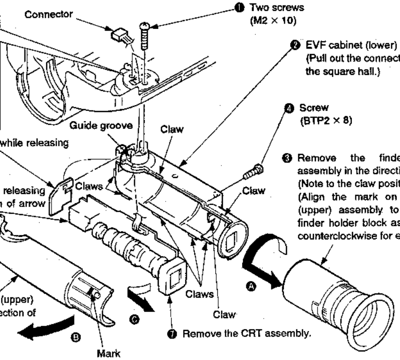
⑫ Flexible connector (drum)

2-13. REMOVAL OF EVF ASSEMBLY

Installation after removing the tilt lock plate and leaf spring



※ Install the leaf spring and tilt lock plate in the seqquence to the cabinet (R) assembly (lock with the guide claw), and then insert the EVF assembly with its guide groove going along the cabinet (R) assembly guide.



① Two screws
(M2 × 10)

② EVF cabinet (lower) assembly
(Pull out the connector through the square hall.)

③ Remove the finder holder block assembly in the direction of arrow Ⓐ. (Note to the claw position.)
(Align the mark on the EVF cabinet (upper) assembly to the edge of the finder holder block assembly and turn it counterclockwise for easy removal.)

④ Screw
(BTP2 × 8)

⑤ Pull the EVF cabinet (upper) assembly up in the direction of arrow Ⓑ.

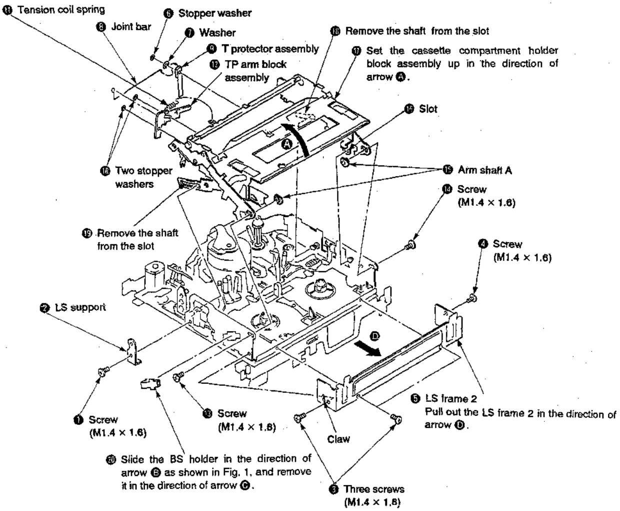
⑥ Remove the TL-26 board while releasing it from the claw.

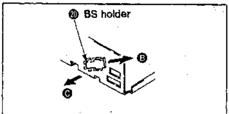
⑦ Remove the CRT assembly.

⑧ Remove the VF-19 board while releasing it from the claw in the direction of arrow Ⓒ.

2-14. REMOVAL OF CASSETTE COMPARTMENT HOLDER BLOCK ASSEMBLY

Set to USE mode first.
(As for setting to USE mode, refer to "1-4. OPERATION OF MODE SELECTOR" in "8 mm VIDEO MECHANISM BLOCK ADJUSTMENT MANUAL II FL MECHANISM (Q MECHANISM)".)


⑪ Tension coil spring
⑥ Stopper washer
⑧ Joint bar
⑦ Washer
⑨ T protector assembly
⑫ TP arm block assembly
⑱ Remove the shaft from the slot
⑰ Set the cassette compartment holder block assembly up in the direction of arrow Ⓐ.
⑯ Slot
Ⓐ
⑩ Two stopper washers
⑮ Arm shaft A
⑭ Screw (M1.4 × 1.6)
⑲ Remove the shaft from the slot
④ Screw (M1.4 × 1.6)
② LS support
Ⓓ
⑤ LS frame 2
Pull out the LS frame 2 in the direction of arrow Ⓓ.
① Screw (M1.4 × 1.6)
⑬ Screw (M1.4 × 1.6)
Claw
⑳ Slide the BS holder in the direction of arrow Ⓑ as shown in Fig. 1, and remove it in the direction of arrow Ⓒ.
③ Three screws (M1.4 × 1.6)

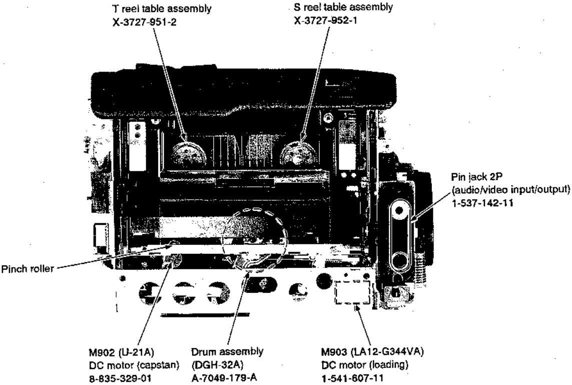


Note : Be careful not to fall the compression coil spring and the steel bowl in the BS holder, when removing the BS holder.

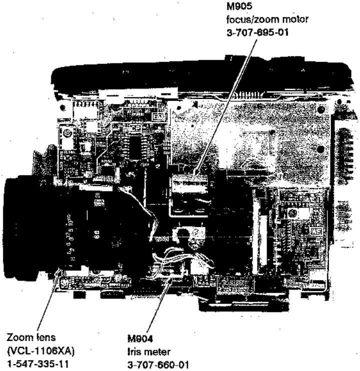
Fig. 1

2-15. INTERNAL VIEW

— Right Side —

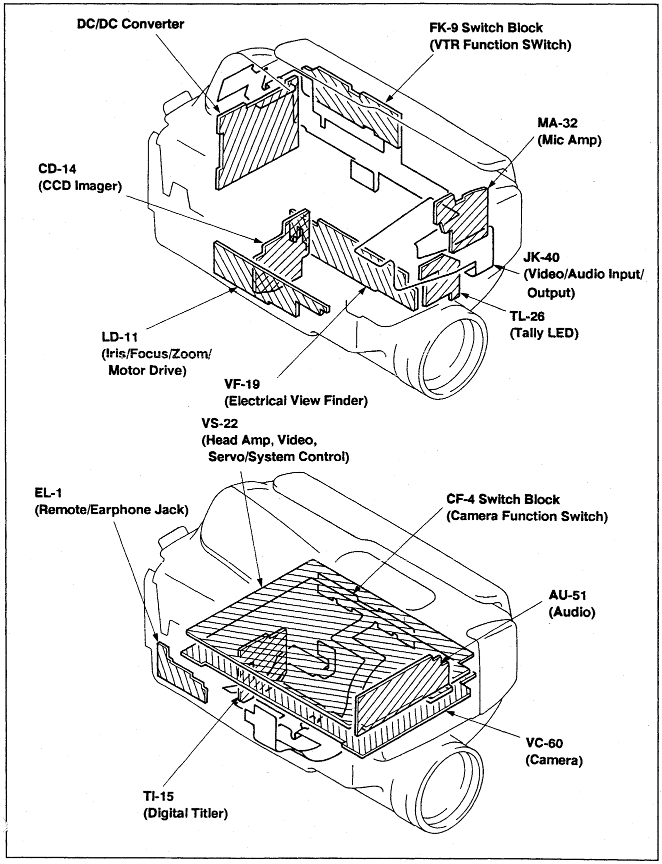

T reel table assembly
X-3727-951-2
S reel table assembly
X-3727-952-1
Pin jack 2P
(audio/video input/output)
1-537-142-11
Pinch roller
M902 (U-21A)
DC motor (capstan)
8-835-329-01
Drum assembly
(DGH-32A)
A-7049-179-A
M903 (LA12-G344VA)
DC motor (loading)
1-541-607-11

— Left Side —

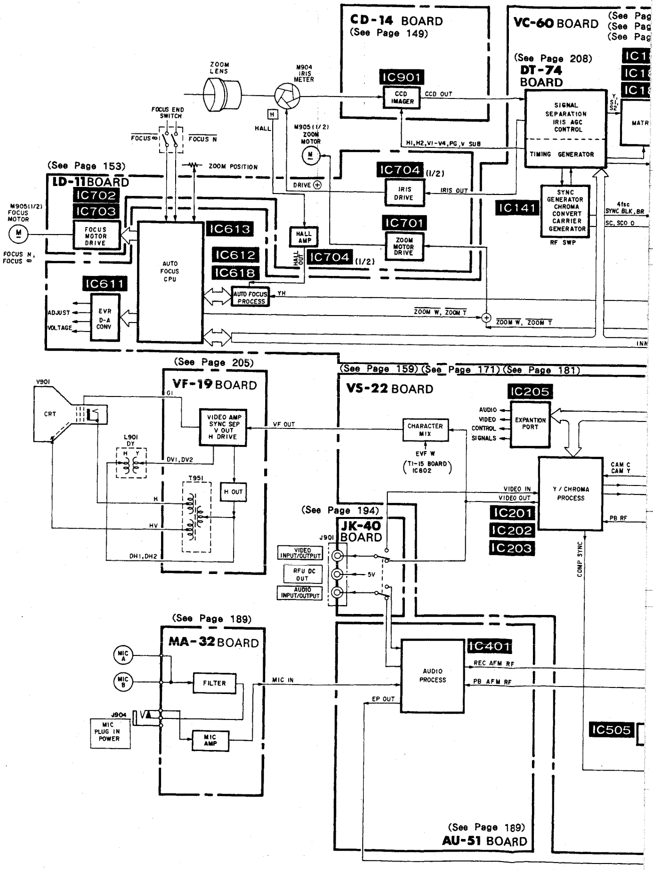

M905
focus/zoom motor
3-707-695-01
Zoom lens
(VCL-1106XA)
1-547-335-11
M904
Iris meter
3-707-660-01

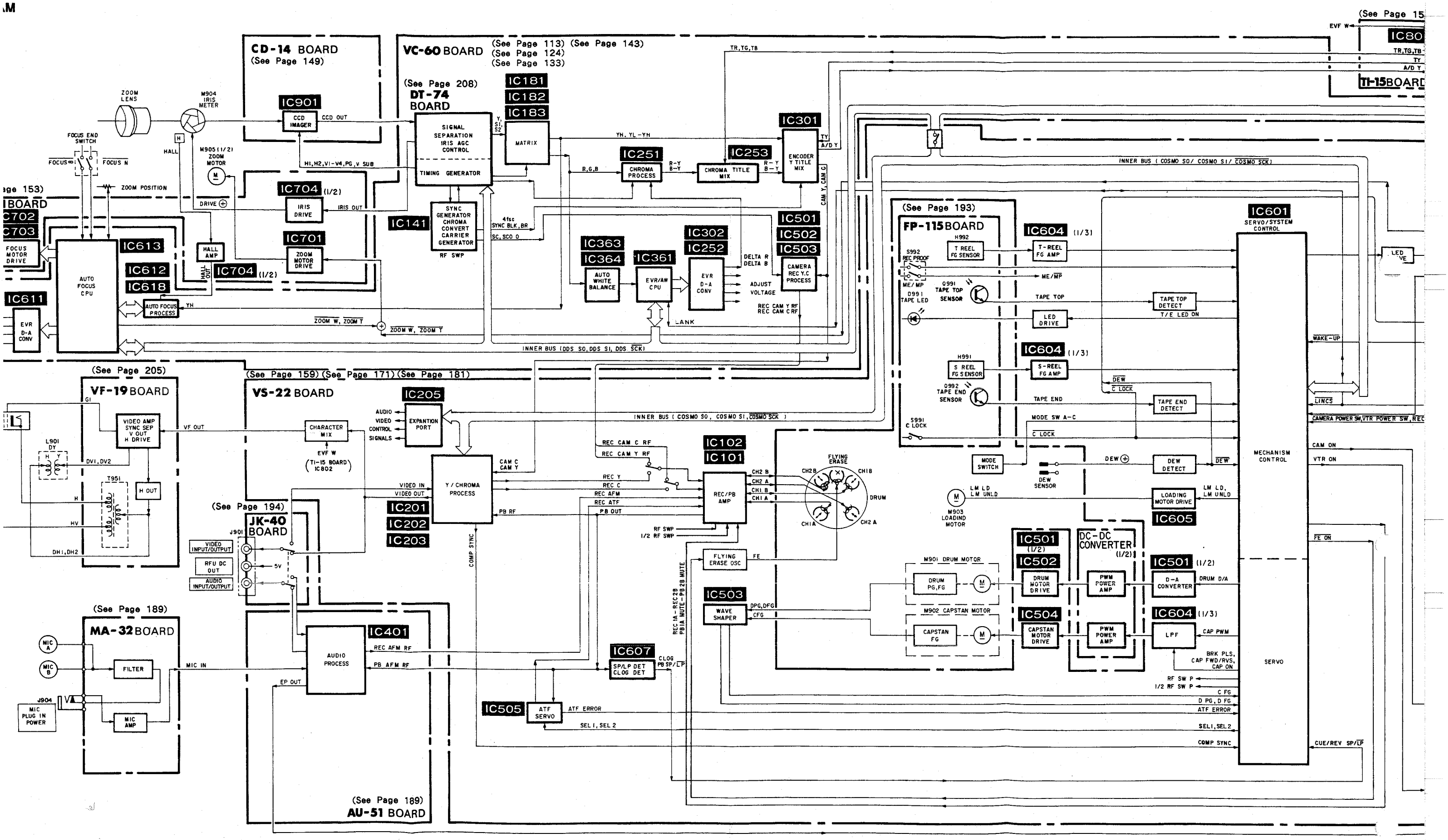
SECTION 3
DIAGRAMS

3-1. CIRCUIT BOARDS LOCATION

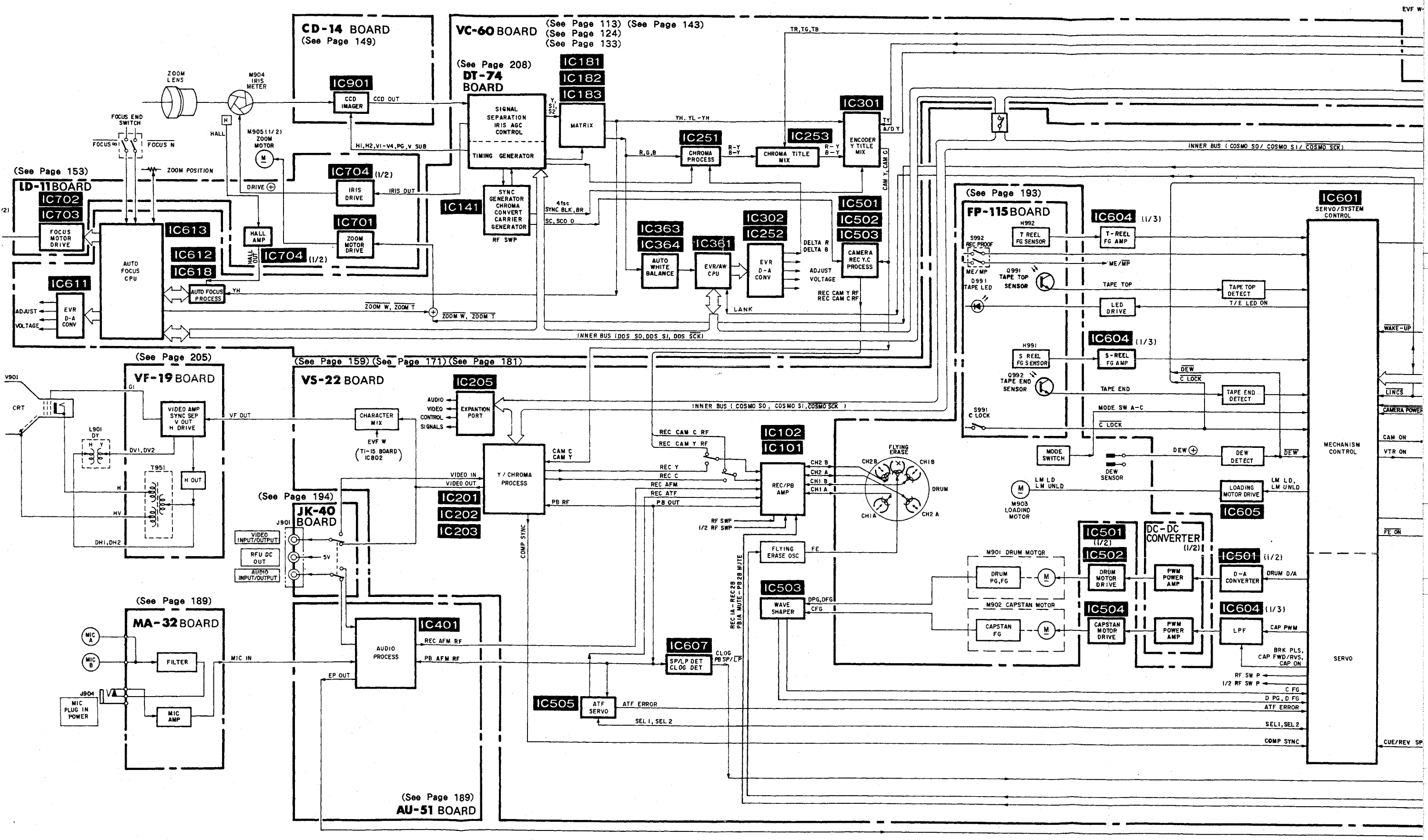

DC/DC Converter
FK-9 Switch Block
(VTR Function SWitch)
MA-32
(Mic Amp)
CD-14
(CCD Imager)
JK-40
(Video/Audio Input/
Output)
TL-26
(Tally LED)
LD-11
(Iris/Focus/Zoom/
Motor Drive)
VF-19
(Electrical View Finder)
VS-22
(Head Amp, Video,
Servo/System Control)
EL-1
(Remote/Earphone Jack)
CF-4 Switch Block
(Camera Function Switch)
AU-51
(Audio)
VC-60
(Camera)
TI-15
(Digital Titler)

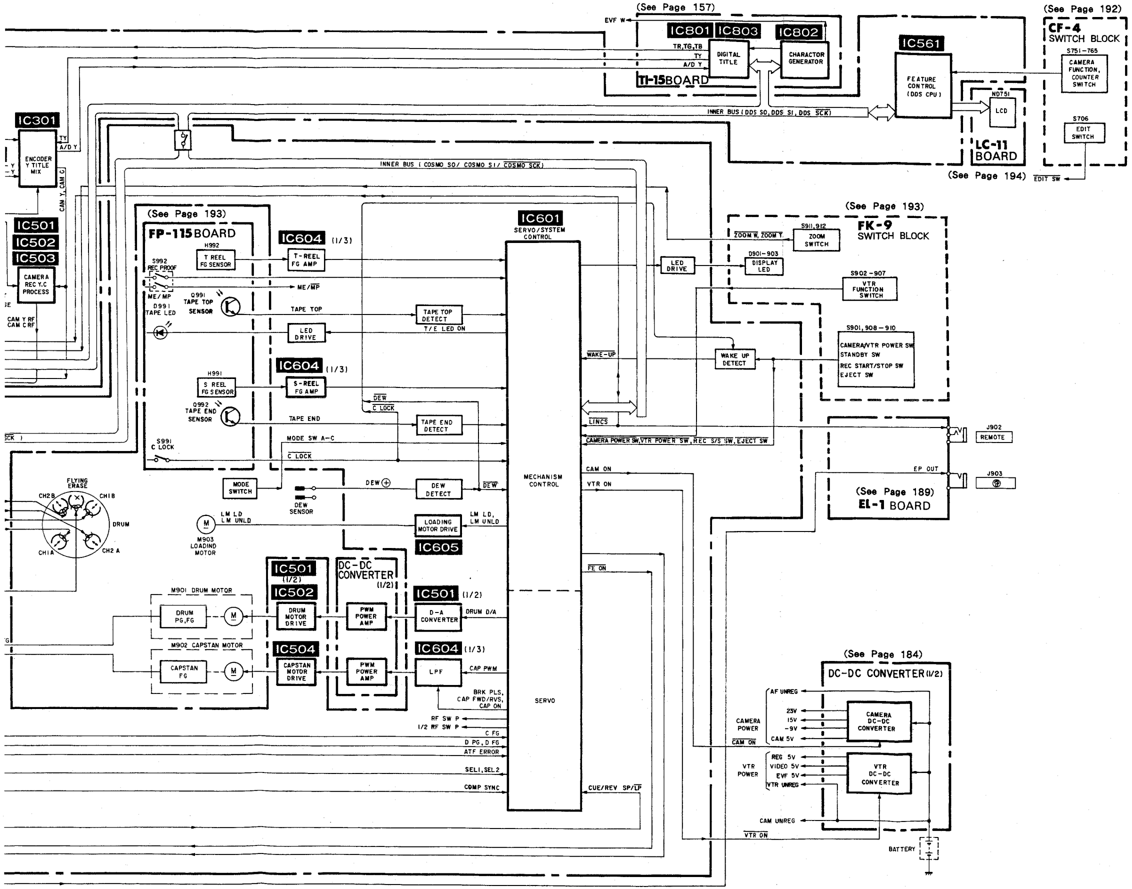
3-2. OVERALL BLOCK DIAGRAM


ZOOM LENS
M904 IRIS METER
FOCUS END SWITCH
FOCUS ∞
FOCUS N
HALL
H
M905(1/2) ZOOM MOTOR
M
ZOOM POSITION
DRIVE ⊕
(See Page 153)
LD-11 BOARD
IC702
IC703
M905(1/2) FOCUS MOTOR
FOCUS MOTOR DRIVE
FOCUS N, FOCUS ∞
AUTO FOCUS CPU
IC613
IC612
IC618
HALL AMP
HALL OUT
IC704 (1/2)
IC611
EVR D-A CONV
ADJUST
VOLTAGE
AUTO FOCUS PROCESS
YH
CD-14 BOARD
(See Page 149)
IC901
CCD IMAGER
CCD OUT
H1,H2,V1-V4,PG,V SUB
IC704 (1/2)
IRIS DRIVE
IRIS OUT
IC701
ZOOM MOTOR DRIVE
ZOOM W, ZOOM T
ZOOM W, ZOOM T
VC-60 BOARD
(See Page 208)
DT-74 BOARD
SIGNAL SEPARATION IRIS AGC CONTROL
TIMING GENERATOR
Y, S1, S2
IC141
SYNC GENERATOR CHROMA CONVERT CARRIER GENERATOR
RF SWP
4fsc
SYNC BLK,BR
SC, SCO O
(See Page 205)
VF-19 BOARD
V901
CRT
G1
VIDEO AMP SYNC SEP V OUT H DRIVE
VF OUT
L901 DY
H Y
DV1,DV2
T951
H OUT
H
HV
DH1,DH2
(See Page 159) (See Page 171) (See Page 181)
VS-22 BOARD
IC205
AUDIO
VIDEO
CONTROL
SIGNALS
EXPANTION PORT
CHARACTER MIX
EVF W
(TI-15 BOARD IC602)
CAM C
CAM Y
VIDEO IN
VIDEO OUT
Y / CHROMA PROCESS
PB RF
IC201
IC202
IC203
COMP SYNC
(See Page 194)
JK-40 BOARD
J901
VIDEO INPUT/OUTPUT
RFU DC OUT
5V
AUDIO INPUT/OUTPUT
(See Page 189)
MA-32 BOARD
MIC A
MIC B
FILTER
J904
MIC PLUG IN POWER
MIC AMP
MIC IN
IC401
AUDIO PROCESS
REC AFM RF
PB AFM RF
EP OUT
(See Page 189)
AU-51 BOARD
IC505

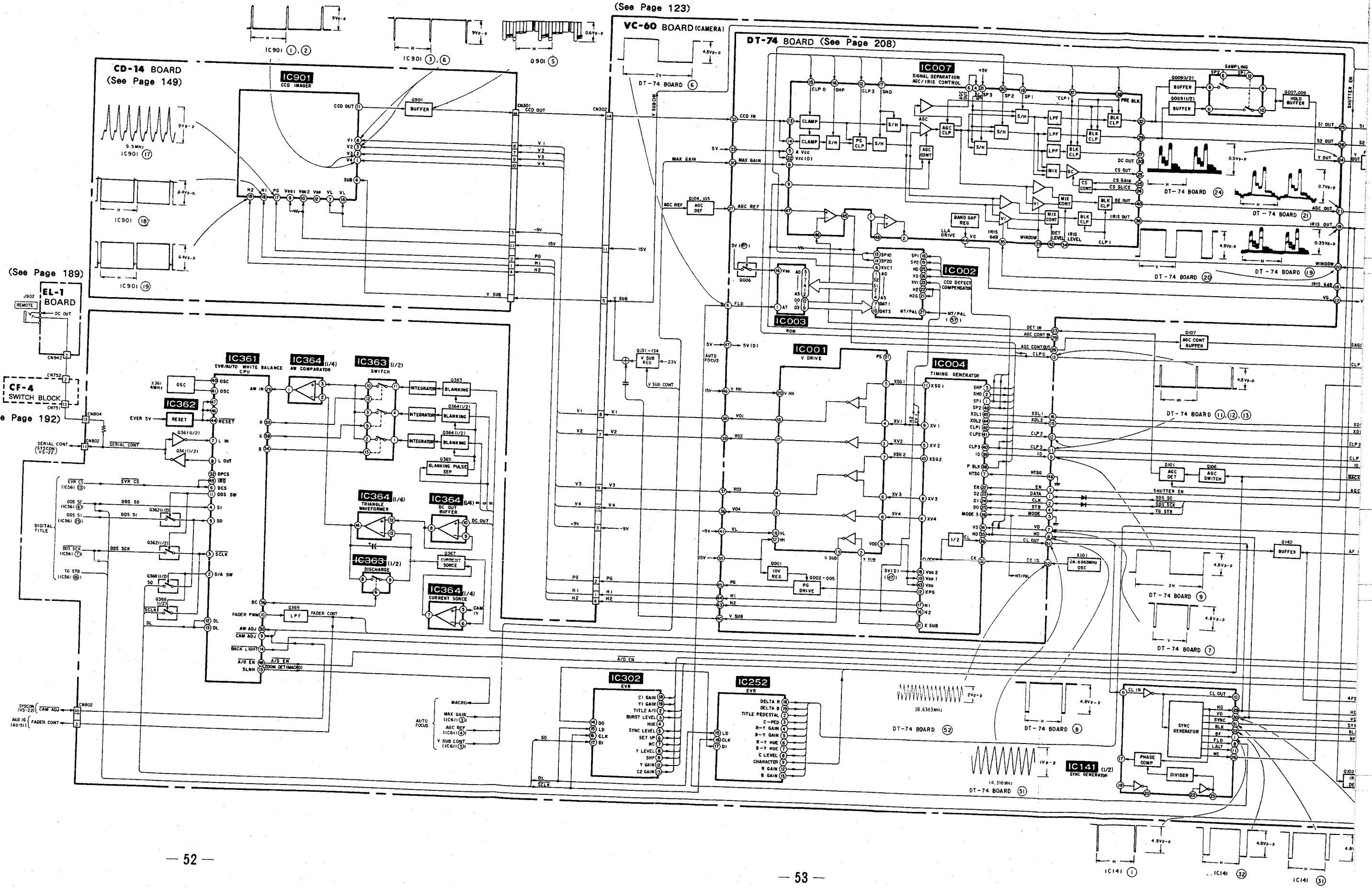

CD-14 BOARD
(See Page 149)
VC-60 BOARD
(See Page 113) (See Page 143)
(See Page 124)
(See Page 133)
(See Page 208)
DT-74 BOARD
ZOOM LENS
M904 IRIS METER
IC901
CCD IMAGER
CCD OUT
SIGNAL SEPARATION IRIS AGC CONTROL
TIMING GENERATOR
IC181
IC182
IC183
MATRIX
FOCUS END SWITCH
FOCUS ∞
FOCUS N
HALL
M905 (1/2) ZOOM MOTOR
ZOOM POSITION
H1,H2,V1-V4,PG,V SUB
IC704 (1/2)
IRIS DRIVE
IRIS OUT
DRIVE ⊕
IC701
ZOOM MOTOR DRIVE
HALL AMP
HALL OUT
IC704 (1/2)
IC141
SYNC GENERATOR CHROMA CONVERT CARRIER GENERATOR
RF SWP
4fsc
SYNC BLK,BR
SC,SCO 0
YH, YL-YH
R,G,B
IC251
CHROMA PROCESS
R-Y
B-Y
IC253
CHROMA TITLE MIX
IC301
ENCODER Y TITLE MIX
TY
A/D Y
TR,TG,TB
CAM Y, CAM C
IC363
IC364
AUTO WHITE BALANCE
IC361
EVR/AW CPU
IC302
IC252
EVR D-A CONV
DELTA R
DELTA B
ADJUST VOLTAGE
REC CAM Y RF
REC CAM C RF
IC501
IC502
IC503
CAMERA REC Y,C PROCESS
LANK
INNER BUS (DDS SO, DDS SI, DDS SCK)
INNER BUS (COSMO SO/ COSMO SI/ COSMO SCK)
IC613
IC612
IC618
AUTO FOCUS CPU
AUTO FOCUS PROCESS
YH
ZOOM W, ZOOM T
IC611
EVR D-A CONV
FOCUS MOTOR DRIVE
ge 153)
BOARD
C702
C703
(See Page 205)
VF-19 BOARD
G1
VIDEO AMP SYNC SEP V OUT H DRIVE
VF OUT
L901 DY
DV1,DV2
T951
H OUT
H
HV
DH1,DH2
(See Page 159) (See Page 171) (See Page 181)
VS-22 BOARD
IC205
AUDIO
VIDEO
CONTROL
SIGNALS
EXPANTION PORT
CHARACTER MIX
EVF W
(TI-15 BOARD IC802)
Y/CHROMA PROCESS
CAM C
CAM Y
VIDEO IN
VIDEO OUT
IC201
IC202
IC203
PB RF
COMP SYNC
(See Page 194)
JK-40 BOARD
J901
VIDEO INPUT/OUTPUT
RFU DC OUT
AUDIO INPUT/OUTPUT
5V
REC CAM C RF
REC CAM Y RF
REC Y
REC C
REC AFM
REC ATF
PB OUT
IC102
IC101
REC/PB AMP
CH2 B
CH2 A
CH1 B
CH1 A
RF SWP
1/2 RF SWP
FLYING ERASE
CH2B
CH1B
CH1A
CH2 A
DRUM
FLYING ERASE OSC
FE
REC 1A-REC 2B
PB1A MUTE-PB2B MUTE
IC503
WAVE SHAPER
DPG,DFG
CFG
(See Page 189)
MA-32 BOARD
MIC A
MIC B
FILTER
MIC IN
J904
MIC PLUG IN POWER
MIC AMP
IC401
AUDIO PROCESS
REC AFM RF
PB AFM RF
EP OUT
IC607
SP/LP DET CLOG DET
CLOG
PB SP/LP
IC505
ATF SERVO
ATF ERROR
SEL 1, SEL 2
(See Page 189)
AU-51 BOARD
(See Page 193)
FP-115 BOARD
H992
T REEL FG SENSOR
IC604 (1/3)
T-REEL FG AMP
S992 REC PROOF
ME/MP
Q991 TAPE TOP SENSOR
D991 TAPE LED
TAPE TOP
LED DRIVE
TAPE TOP DETECT
T/E LED ON
H991
S REEL FG SENSOR
IC604 (1/3)
S-REEL FG AMP
Q992 TAPE END SENSOR
TAPE END
TAPE END DETECT
S991 C LOCK
MODE SW A-C
C LOCK
DEW
MODE SWITCH
DEW ⊕
DEW SENSOR
DEW DETECT
M903 LOADING MOTOR
LM LD
LM UNLD
LOADING MOTOR DRIVE
IC605
IC601
SERVO/SYSTEM CONTROL
MECHANISM CONTROL
SERVO
WAKE-UP
LINCS
CAMERA POWER SW,VTR POWER SW,REC
CAM ON
VTR ON
FE ON
CUE/REV SP/LP
LED DRIVE
IC501 (1/2)
IC502
DRUM MOTOR DRIVE
M901 DRUM MOTOR
DRUM PG,FG
DC-DC CONVERTER (1/2)
PWM POWER AMP
IC501 (1/2)
D-A CONVERTER
DRUM D/A
IC504
CAPSTAN MOTOR DRIVE
M902 CAPSTAN MOTOR
CAPSTAN FG
IC604 (1/3)
LPF
CAP PWM
BRK PLS, CAP FWD/RVS, CAP ON
RF SW P
1/2 RF SW P
C FG
D PG, D FG
ATF ERROR
SEL1, SEL2
COMP SYNC
(See Page 15
EVF W
IC80
TR,TG,TB
TY
A/D Y
TI-15 BOARD

DIAGRAM

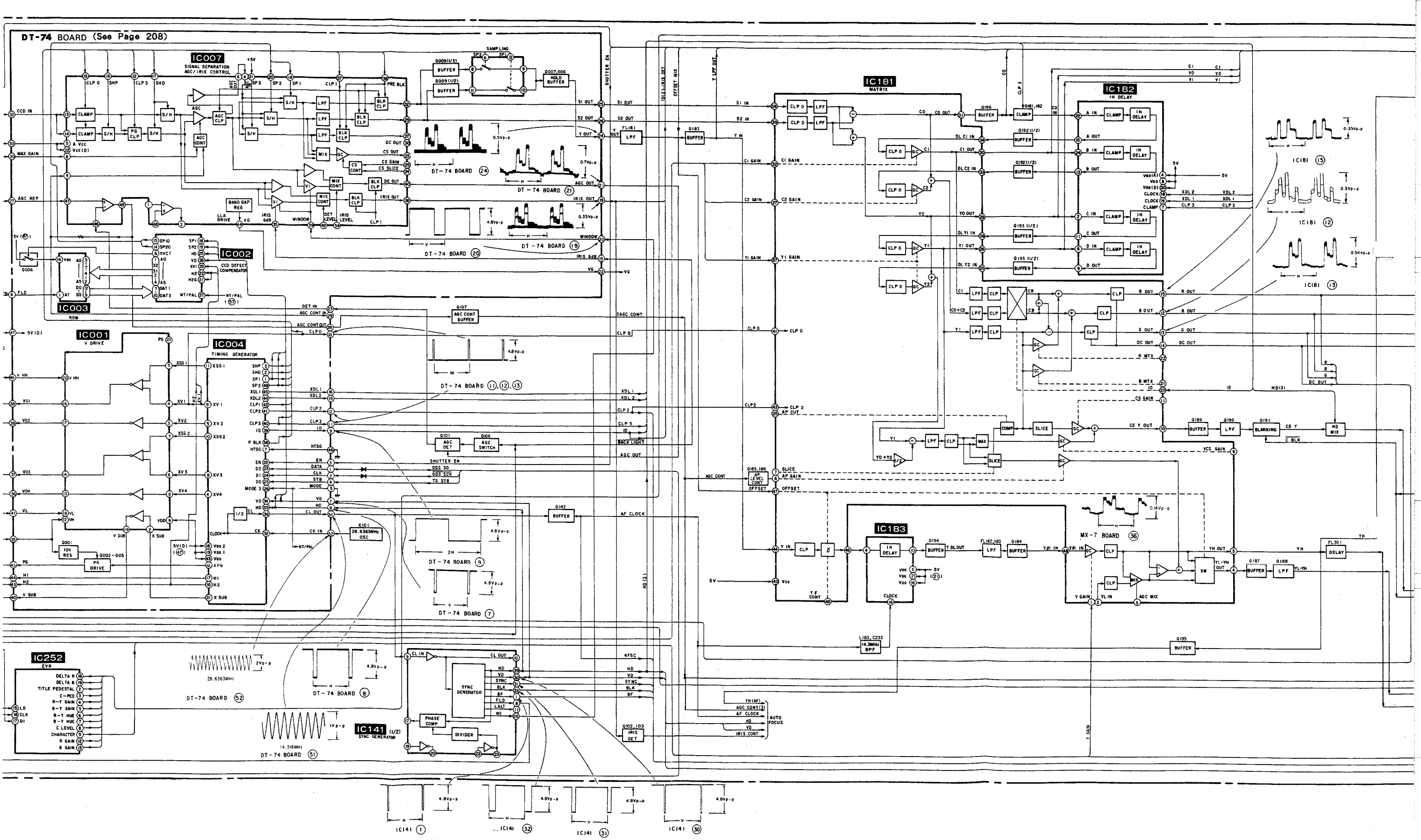

CD-14 BOARD (See Page 149)
IC901
CCD IMAGER
CCD OUT
VC-60 BOARD (See Page 113) (See Page 124) (See Page 133) (See Page 143)
(See Page 208) DT-74 BOARD
IC181
IC182
IC183
SIGNAL SEPARATION IRIS AGC CONTROL
TIMING GENERATOR
MATRIX
IC141
SYNC GENERATOR CHROMA CONVERT CARRIER GENERATOR
RF SWP
4fsc SYNC BLK, BR
SC, SCO O
YH, YL-YH
R, G, B
IC251
CHROMA PROCESS
R-Y
B-Y
IC253
CHROMA TITLE MIX
IC301
ENCODER Y TITLE MIX
TY
A/D Y
TR, TG, TB
CAM Y, CAM C
IC363
IC364
AUTO WHITE BALANCE
IC361
EVR/AW CPU
IC302
IC252
EVR D-A CONV
DELTA R
DELTA B
ADJUST VOLTAGE
IC501
IC502
IC503
CAMERA REC Y,C PROCESS
REC CAM Y RF
REC CAM C RF
LANK
INNER BUS (DDS SO, DDS SI, DDS SCK)
INNER BUS (COSMO SO / COSMO SI / COSMO SCK)
ZOOM LENS
M904 IRIS METER
FOCUS END SWITCH
FOCUS ∞
FOCUS N
HALL
M905 (1/2) ZOOM MOTOR
ZOOM POSITION
HI, H2, VI-V4, PG, V SUB
IC704 (1/2)
IRIS DRIVE
IRIS OUT
DRIVE ⊕
IC701
ZOOM MOTOR DRIVE
HALL AMP
HALL OUT
IC704 (1/2)
(See Page 153)
LD-11 BOARD
IC702
IC703
FOCUS MOTOR DRIVE
AUTO FOCUS CPU
IC613
IC612
IC618
AUTO FOCUS PROCESS
YH
IC611
EVR D-A CONV
ADJUST
VOLTAGE
ZOOM W, ZOOM T
(See Page 205)
VF-19 BOARD
V901
CRT
GI
VIDEO AMP SYNC SEP V OUT H DRIVE
VF OUT
L901 DY
DV1, DV2
T951
H OUT
H
HV
DH1, DH2
(See Page 159) (See Page 171) (See Page 181)
VS-22 BOARD
CHARACTER MIX
EVF W
(TI-15 BOARD IC802)
AUDIO
VIDEO
CONTROL
SIGNALS
IC205
EXPANTION PORT
Y / CHROMA PROCESS
CAM C
CAM Y
VIDEO IN
VIDEO OUT
IC201
IC202
IC203
PB RF
COMP SYNC
REC CAM C RF
REC CAM Y RF
REC Y
REC C
REC AFM
REC ATF
PB OUT
RF SWP
1/2 RF SWP
IC102
IC101
REC/PB AMP
CH2 B
CH2 A
CH1 B
CH1 A
FLYING ERASE
DRUM
FLYING ERASE OSC
FE
IC503
WAVE SHAPER
DPG, DFG
CFG
REC 1A-REC 2B
PB1A MUTE-PB 2B MUTE
(See Page 194)
JK-40 BOARD
J901
VIDEO INPUT/OUTPUT
RFU DC OUT
AUDIO INPUT/OUTPUT
5V
(See Page 189)
MA-32 BOARD
MIC A
MIC B
FILTER
MIC IN
J904
MIC PLUG IN POWER
MIC AMP
IC401
AUDIO PROCESS
REC AFM RF
PB AFM RF
EP OUT
(See Page 189)
AU-51 BOARD
IC607
SP/LP DET CLOG DET
CLOG
PB SP/LP
IC505
ATF SERVO
ATF ERROR
SEL 1, SEL 2
(See Page 193)
FP-115 BOARD
H992
T REEL FG SENSOR
IC604 (1/3)
T-REEL FG AMP
S992 REC PROOF
ME/MP
Q991 TAPE TOP SENSOR
D991 TAPE LED
TAPE TOP
TAPE TOP DETECT
T/E LED ON
LED DRIVE
H991
S REEL FG SENSOR
IC604 (1/3)
S-REEL FG AMP
Q992 TAPE END SENSOR
TAPE END
TAPE END DETECT
DEW
C LOCK
S991 C LOCK
MODE SW A-C
MODE SWITCH
DEW ⊕
DEW SENSOR
DEW DETECT
M903 LOADING MOTOR
LM LD
LM UNLD
LOADING MOTOR DRIVE
IC605
IC501 (1/2)
IC502
M901 DRUM MOTOR
DRUM PG, FG
DRUM MOTOR DRIVE
DC-DC CONVERTER (1/2)
PWM POWER AMP
IC501 (1/2)
D-A CONVERTER
DRUM D/A
M902 CAPSTAN MOTOR
CAPSTAN FG
IC504
CAPSTAN MOTOR DRIVE
IC604 (1/3)
LPF
CAP PWM
BRK PLS, CAP FWD/RVS, CAP ON
RF SW P
1/2 RF SW P
C FG
D PG, D FG
ATF ERROR
SEL1, SEL2
COMP SYNC
IC601
SERVO/SYSTEM CONTROL
MECHANISM CONTROL
SERVO
EVF W
WAKE-UP
LINCS
CAMERA POWER
CAM ON
VTR ON
FE ON
CUE/REV SP

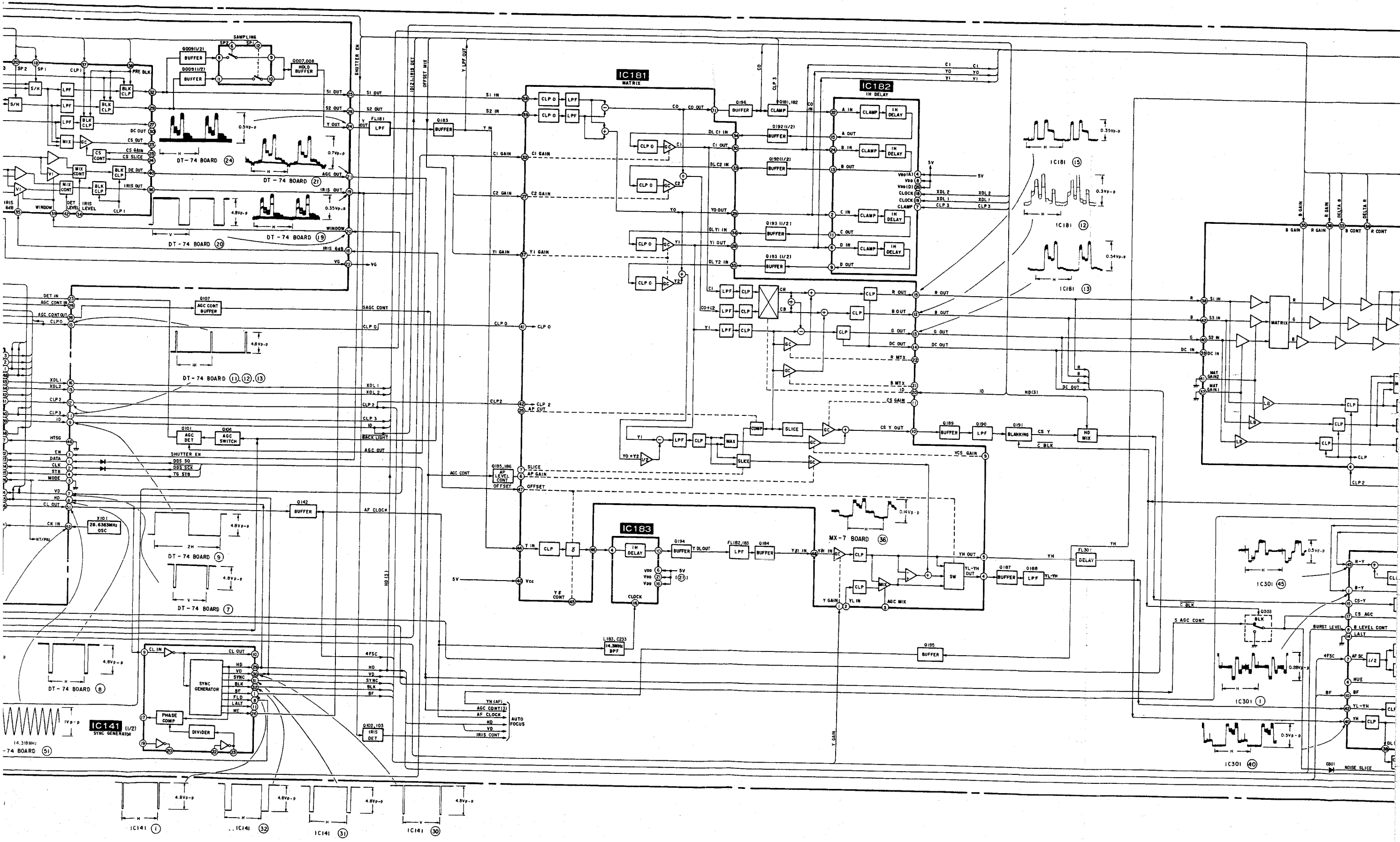

(See Page 157)
EVF W
IC801
IC803
IC802
TR,TG,TB
TY
A/D Y
DIGITAL TITLE
CHARACTOR GENERATOR
TI-15 BOARD
IC561
FEATURE CONTROL (DDS CPU)
ND751
LCD
LC-11 BOARD
(See Page 194)
INNER BUS (DDS SO, DDS SI, DDS SCK)
(See Page 192)
CF-4 SWITCH BLOCK
S751-765
CAMERA FUNCTION, COUNTER SWITCH
S706
EDIT SWITCH
EDIT SW
IC301
TY
A/D Y
ENCODER Y TITLE MIX
CAM Y, CAM C
INNER BUS (COSMO SO/ COSMO SI/ COSMO SCK)
IC501
IC502
IC503
CAMERA REC Y.C PROCESS
CAM Y RF
CAM C RF
(See Page 193)
FP-115 BOARD
H992
T REEL FG SENSOR
S992 REC PROOF
ME/MP
Q991 TAPE TOP SENSOR
D991 TAPE LED
H991
S REEL FG SENSOR
Q992 TAPE END SENSOR
S991 C LOCK
IC604 (1/3)
T-REEL FG AMP
ME/MP
TAPE TOP
TAPE TOP DETECT
LED DRIVE
T/E LED ON
IC604 (1/3)
S-REEL FG AMP
DEW
C LOCK
TAPE END
TAPE END DETECT
MODE SW A-C
C LOCK
MODE SWITCH
DEW SENSOR
DEW
DEW DETECT
DEW
IC601
SERVO/SYSTEM CONTROL
MECHANISM CONTROL
SERVO
WAKE-UP
LINCS
CAMERA POWER SW, VTR POWER SW, REC S/S SW, EJECT SW
CAM ON
VTR ON
FE ON
CUE/REV SP/LP
LED DRIVE
WAKE UP DETECT
(See Page 193)
FK-9 SWITCH BLOCK
S911, 912
ZOOM W, ZOOM T
ZOOM SWITCH
D901-903
DISPLAY LED
S902-907
VTR FUNCTION SWITCH
S901, 908-910
CAMERA/VTR POWER SW
STANDBY SW
REC START/STOP SW
EJECT SW
J902
REMOTE
EP OUT
J903
(See Page 189)
EL-1 BOARD
FLYING ERASE
CH2B
CH1B
DRUM
CH1A
CH2 A
M
LM LD
LM UNLD
M903 LOADING MOTOR
LOADING MOTOR DRIVE
LM LD, LM UNLD
IC605
M901 DRUM MOTOR
DRUM PG,FG
M
IC501 (1/2)
IC502
DRUM MOTOR DRIVE
DC-DC CONVERTER (1/2)
PWM POWER AMP
IC501 (1/2)
D-A CONVERTER
DRUM D/A
M902 CAPSTAN MOTOR
CAPSTAN FG
M
IC504
CAPSTAN MOTOR DRIVE
PWM POWER AMP
IC604 (1/3)
LPF
CAP PWM
BRK PLS, CAP FWD/RVS, CAP ON
RF SW P
1/2 RF SW P
C FG
D PG, D FG
ATF ERROR
SEL1, SEL2
COMP SYNC
SCK
(See Page 184)
DC-DC CONVERTER (1/2)
AF UNREG
CAMERA POWER
23V
15V
-9V
CAM 5V
CAMERA DC-DC CONVERTER
CAM ON
VTR POWER
REG 5V
VIDEO 5V
EVF 5V
VTR UNREG
VTR DC-DC CONVERTER
CAM UNREG
VTR ON
BATTERY

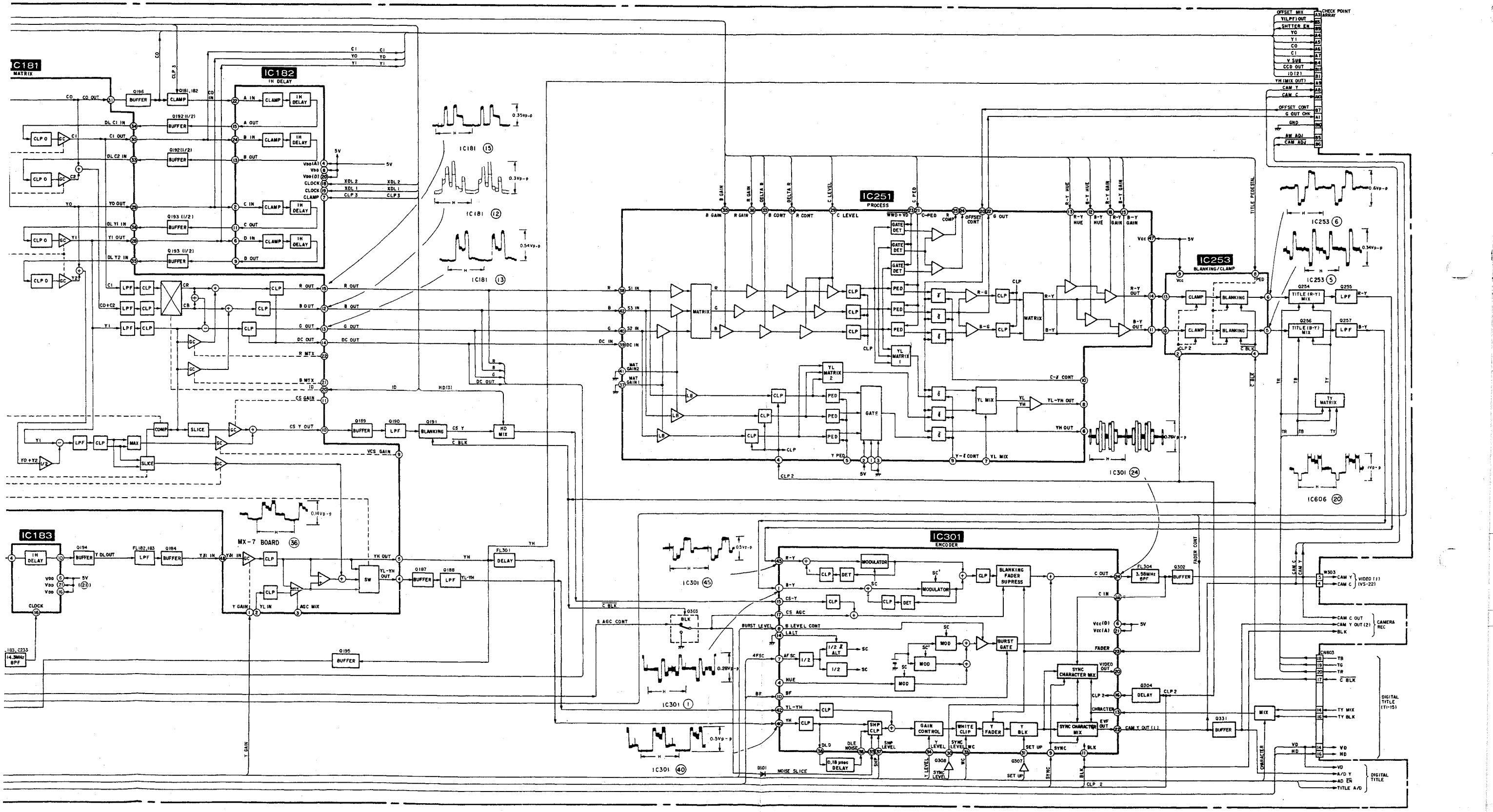
3-3. CAMERA BLOCK DIAGRAM



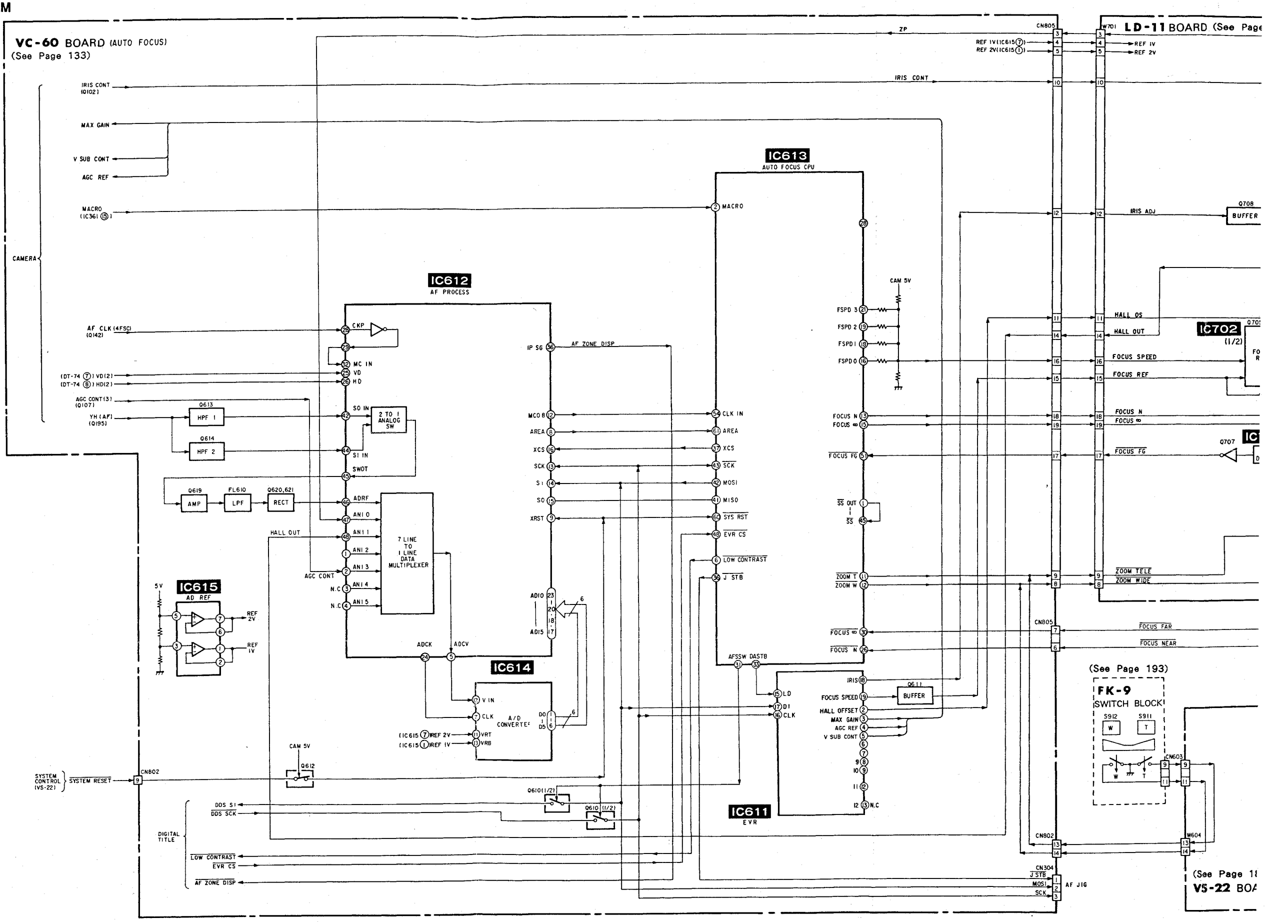
(See Page 123)
VC-60 BOARD (CAMERA)
DT-74 BOARD (See Page 208)
CD-14 BOARD
(See Page 149)
IC901
CCD IMAGER
Q901
BUFFER
CCD OUT
IC901 ①, ②
IC901 ③, ⑥
Q901 ⑤
IC901 ⑰
IC901 ⑱
IC901 ⑲
9.5MHz
DT-74 BOARD ⑥
(See Page 189)
EL-1 BOARD
J902 REMOTE
CF-4 SWITCH BLOCK
(See Page 192)
IC361
EVR/AUTO WHITE BALANCE CPU
IC362
RESET
IC364 (1/4)
AW COMPARATOR
IC363 (1/2)
SWITCH
INTEGRATOR
BLANKING
BLANKING PULSE SEP
IC364 (1/4) TRIANGLE WAVEFORMER
IC364 (1/4) DC OUT BUFFER
IC363 (1/2) DISCHARGE
CURRENT SORCE
IC364 (1/4) CURRENT SORCE
LPF
SERIAL CONT
DIGITAL TITLE
SYSCON (VS-22)
AUDIO (AU-51)
CAM ADJ
FADER CONT
AUTO FOCUS
MACRO
MAX GAIN
AGC REF
V SUB CONT
IC302
EVR
IC252
EVR
IC007
SIGNAL SEPARATION AGC/IRIS CONTROL
CLAMP
S/H
PG CLP
AGC CLP
AGC CONT
LPF
BLK CLP
MIX
CS CONT
MIX CONT
BAND GAP REG
IC002
CCD DEFECT COMPENSATOR
IC003
ROM
IC001
V DRIVE
IC004
TIMING GENERATOR
Q009 (1/2) BUFFER
Q007, 008 HOLD BUFFER
SAMPLING
Q104, 105 AGC DEF
Q107 AGC CONT BUFFER
Q101 AGC DET
Q106 AGC SWITCH
Q131-134 V SUB REG
Q001 10V REG
Q002-005 PG DRIVE
X101 28.6363MHz OSC
Q142 BUFFER
IC141 (1/2)
SYNC GENERATOR
PHASE COMP
DIVIDER
DT-74 BOARD ㉔
DT-74 BOARD ㉑
DT-74 BOARD ⑲
DT-74 BOARD ⑳
DT-74 BOARD ⑪, ⑫, ⑬
DT-74 BOARD ⑨
DT-74 BOARD ⑦
DT-74 BOARD ⑧
DT-74 BOARD (52)
DT-74 BOARD (51)
28.6363MHz
14.318MHz
IC141 ①
IC141 ㉜
IC141 ㉛
SHUTTER EN

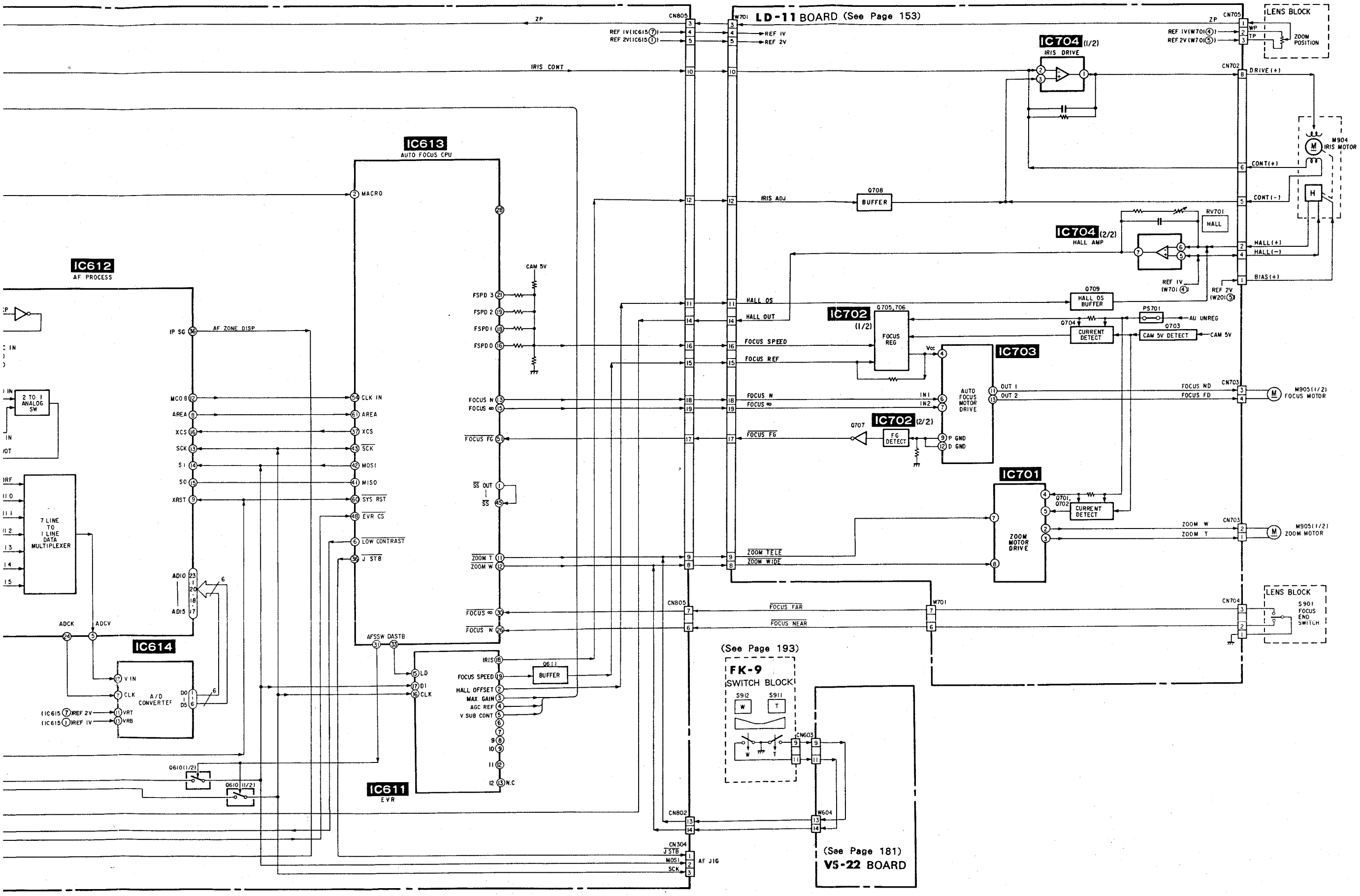

DT-74 BOARD (See Page 208)
IC007
SIGNAL SEPARATION AGC/IRIS CONTROL
IC002
CCD DEFECT COMPENSATOR
IC003
ROM
IC001
V DRIVE
IC004
TIMING GENERATOR
IC252
EVR
IC141
SYNC GENERATOR
IC181
MATRIX
IC182
1H DELAY
IC183
1H DELAY
CCD IN
MAX GAIN
AGC REF
FLD
5V(D)
V HH
V01
V02
V03
V04
VL
PG
H1
H2
V SUB
LD
CLK
DI
DELTA R
DELTA B
TITLE PEDESTAL
C-PED
R-Y GAIN
B-Y GAIN
R-Y HUE
B-Y HUE
C LEVEL
CHARACTER
R GAIN
B GAIN
CLAMP
S/H
PG CLP
LPF
BLK CLP
MIX
AGC CLP
AGC CONT
CS CONT
MIX CONT
BAND GAP REG
BUFFER
HOLD BUFFER
SAMPLING
S1 OUT
S2 OUT
Y OUT
DC OUT
CS OUT
CS GAIN
CS SLICE
DE OUT
AGC OUT
IRIS OUT
WINDOW
IRIS 6dB
VG
DET IN
AGC CONT IN
AGC CONT OUT
CLP0
Q107 AGC CONT BUFFER
Q101 AGC DET
Q106 AGC SWITCH
Q142 BUFFER
X101 28.6363MHz OSC
PHASE COMP
DIVIDER
SYNC GENERATOR
CL IN
CL OUT
HD
VD
SYNC
BLK
BF
FLD
LALT
WE
4FSC
AF CLOCK
AUTO FOCUS
Q102,103 IRIS DET
SHUTTER EN
DDS SD
DDS SCK
TG STB
XDL1
XDL2
CLP2
CLP3
ID
BACK LIGHT
AGC CONT
SLICE
AP GAIN
OFFSET
Q185,186 AP LEVEL CONT
FL181 LPF
Q183 BUFFER
S1 IN
S2 IN
Y IN
C1 GAIN
C2 GAIN
Y1 GAIN
CO OUT
YO OUT
Y1 OUT
DL C1 IN
DL C2 IN
DL Y1 IN
DL Y2 IN
Q196 BUFFER
Q181,182 CLAMP
Q192(1/2) BUFFER
Q193(1/2) BUFFER
A IN
B IN
C IN
D IN
A OUT
B OUT
C OUT
D OUT
IH DELAY
R OUT
G OUT
B OUT
DC OUT
R MTX
B MTX
CS GAIN
CS Y OUT
VCS GAIN
COMP
SLICE
MAX
Q189 BUFFER
Q190 LPF
Q191 BLANKING
HD MIX
C BLK
Y0+Y2
Y GAIN
YL IN
AGC MIX
YH OUT
YL-YH OUT
SW
Q187 BUFFER
Q188 LPF
FL301 DELAY
Q194 BUFFER
FL182,183 LPF
Q184 BUFFER
L183,C233 14.3MHz BPF
Q195 BUFFER
MX-7 BOARD (36)
0.14Vp-p
IC181 (15)
IC181 (12)
IC181 (13)
0.35Vp-p
0.3Vp-p
0.54Vp-p
DT-74 BOARD (24)
DT-74 BOARD (21)
DT-74 BOARD (19)
DT-74 BOARD (20)
DT-74 BOARD (11),(12),(13)
DT-74 BOARD (9)
DT-74 BOARD (7)
DT-74 BOARD (8)
DT-74 BOARD (52)
DT-74 BOARD (51)
28.6363MHz
14.318MHz
2Vp-p
1Vp-p
4.8Vp-p
0.5Vp-p
0.7Vp-p
0.35Vp-p
IC141 (1)
IC141 (32)
IC141 (31)
IC141 (30)


IC181
MATRIX
IC182
1H DELAY
IC183
1H DELAY
IC141 (1/2)
SYNC GENERATOR
SAMPLING
BUFFER
HOLD BUFFER
Q009(1/2)
Q007,008
S/H
LPF
BLK CLP
MIX
GC
CS CONT
MIX CONT
DET LEVEL
IRIS LEVEL
WINDOW
SHUTTER EN
S1 OUT
S2 OUT
Y OUT
DC OUT
CS OUT
CS GAIN
CS SLICE
DE OUT
AGC OUT
IRIS OUT
IRIS 6dB
VG
FL181
Q183
S1 IN
S2 IN
Y IN
C1 GAIN
C2 GAIN
Y1 GAIN
CLP O
CLP 2
AF CUT
SLICE
AP GAIN
OFFSET
Vcc
5V
CO OUT
DL C1 IN
C1 OUT
DL C2 IN
Y0 OUT
DL Y1 IN
Y1 OUT
DL Y2 IN
Q196
Q181,182
CLAMP
Q192(1/2)
Q193(1/2)
A IN
A OUT
B IN
B OUT
C IN
C OUT
D IN
D OUT
CLOCK
R OUT
B OUT
G OUT
R MTX
B MTX
CS GAIN
CS Y OUT
Q189
Q190
Q191
BLANKING
HD MIX
C BLK
VCS GAIN
COMP
SLICE
MAX
Y1+Y2
Q185,186
AP LEVEL CONT
AGC CONT
Q194
Y DL OUT
FL182,183
Q184
Y2L IN
MX-7 BOARD (36)
Y GAIN
YL IN
AGC MIX
YH OUT
YL-YH OUT
SW
Q187
Q188
FL301
DELAY
L183, C233
14.3MHz BPF
CLOCK
Q195
Q142
AF CLOCK
X101
28.6363MHz OSC
CK IN
NT/PAL
Q107
AGC CONT BUFFER
SAGC CONT
Q101
AGC DET
Q106
AGC SWITCH
BACK LIGHT
DDS SO
DDS SCK
TG STB
EN
DATA
CLK
STB
MODE
VD
HD
CL OUT
HTSG
DET IN
AGC CONT IN
AGC CONT OUT
XDL 1
XDL 2
CLP 3
ID
CL IN
SYNC
BLK
BF
FLD
LALT
WE
PHASE COMP
DIVIDER
4FSC
YH (AF)
AGC CONT(3)
AF CLOCK
AUTO FOCUS
IRIS CONT
Q102,103
IRIS DET
HD (3)
Y GAIN
DT-74 BOARD (24)
DT-74 BOARD (21)
DT-74 BOARD (20)
DT-74 BOARD (19)
DT-74 BOARD (11),(12),(13)
DT-74 BOARD (9)
DT-74 BOARD (7)
DT-74 BOARD (8)
-74 BOARD (51)
14.318MHz
IC181 (15)
IC181 (12)
IC181 (13)
IC301 (45)
IC301 (1)
IC301 (40)
IC141 (1)
IC141 (32)
IC141 (31)
IC141 (30)
0.5Vp-p
0.7Vp-p
0.35Vp-p
4.8Vp-p
0.14Vp-p
0.3Vp-p
0.54Vp-p
0.5Vc-p
0.28Vp-p
1Vp-p
MATRIX
S1 IN
S2 IN
S3 IN
DC IN
MAT GAIN2
MAT GAIN1
B GAIN
R GAIN
B CONT
R CONT
LB
CLP
CLP 2
R-Y
B-Y
CS-Y
CS AGC
B LEVEL CONT
BURST LEVEL
LALT
AF SC
1/2
HUE
YL-YH
YH
S AGC CONT
Q303
Q301
NOISE SLICE

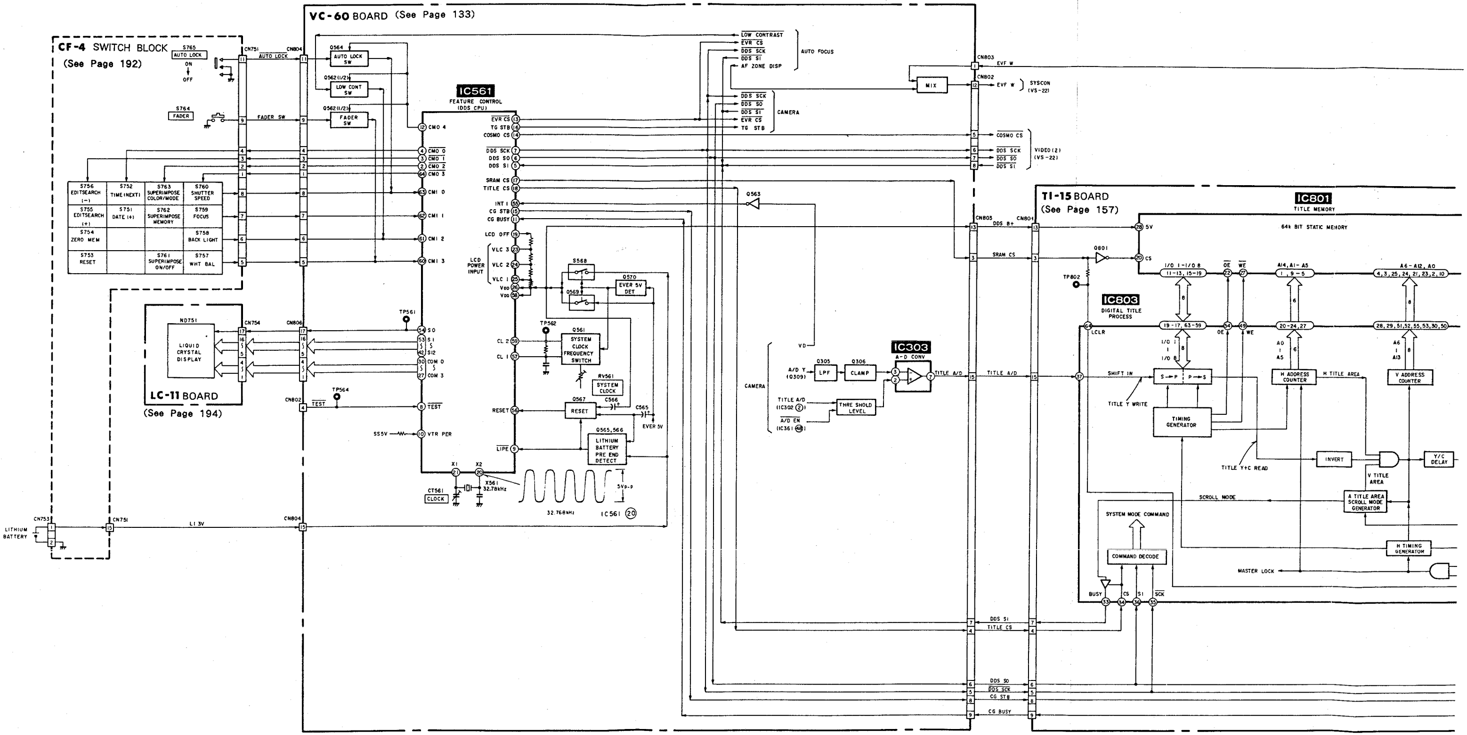

IC181 MATRIX
IC182 1H DELAY
IC183
IC251 PROCESS
IC253 BLANKING/CLAMP
IC301 ENCODER
MX-7 BOARD (36)
CHECK POINT ARRAY
OFFSET MIX
Y(LPF) OUT
SHTTER EN
Y0
Y1
C0
C1
V SUB
CCD OUT
ID(2)
YH(MIX OUT)
CAM Y
CAM C
OFFSET CONT
G OUT CHK
GND
AW ADJ
CAM ADJ
IC181 (15)
IC181 (12)
IC181 (13)
0.35Vp-p
0.3Vp-p
0.54Vp-p
IC253 (6)
IC253 (5)
IC606 (20)
IC301 (24)
IC301 (45)
IC301 (1)
IC301 (40)
0.5Vp-p
0.28Vp-p
0.14Vp-p
0.76Vp-p
B GAIN
R GAIN
DELTA B
DELTA R
C LEVEL
C PED
R-Y HUE
B-Y HUE
R-Y GAIN
B-Y GAIN
TITLE PEDESTAL
MATRIX
GATE DET
PED
YL MATRIX
YL MIX
GATE
CLAMP
BLANKING
TITLE (R-Y) MIX
TITLE (B-Y) MIX
TY MATRIX
LPF
BUFFER
1H DELAY
MODULATOR
BLANKING FADER SUPRESS
BURST GATE
SYNC CHARACTER MIX
GAIN CONTROL
WHITE CLIP
Y FADER
Y BLK
3.58MHz BPF
14.3MHz BPF
0.18µsec DELAY
FL301 DELAY
FL304
Q302
Q303
Q304 DELAY
Q331 BUFFER
MIX
W303
CAM Y
CAM C
VIDEO (J) (VS-22)
CAM C OUT
CAM Y OUT (2)
BLK
CAMERA REC
CN803
TB
TG
TR
C BLK
TY MIX
TY BLK
VD
HD
DIGITAL TITLE (TI-15)
A/D Y
AD EN
TITLE A/D
DIGITAL TITLE
NOISE SLICE
Y GAIN
FADER CONT

3-4. AUTO FOCUS BLOCK DIAGRAM

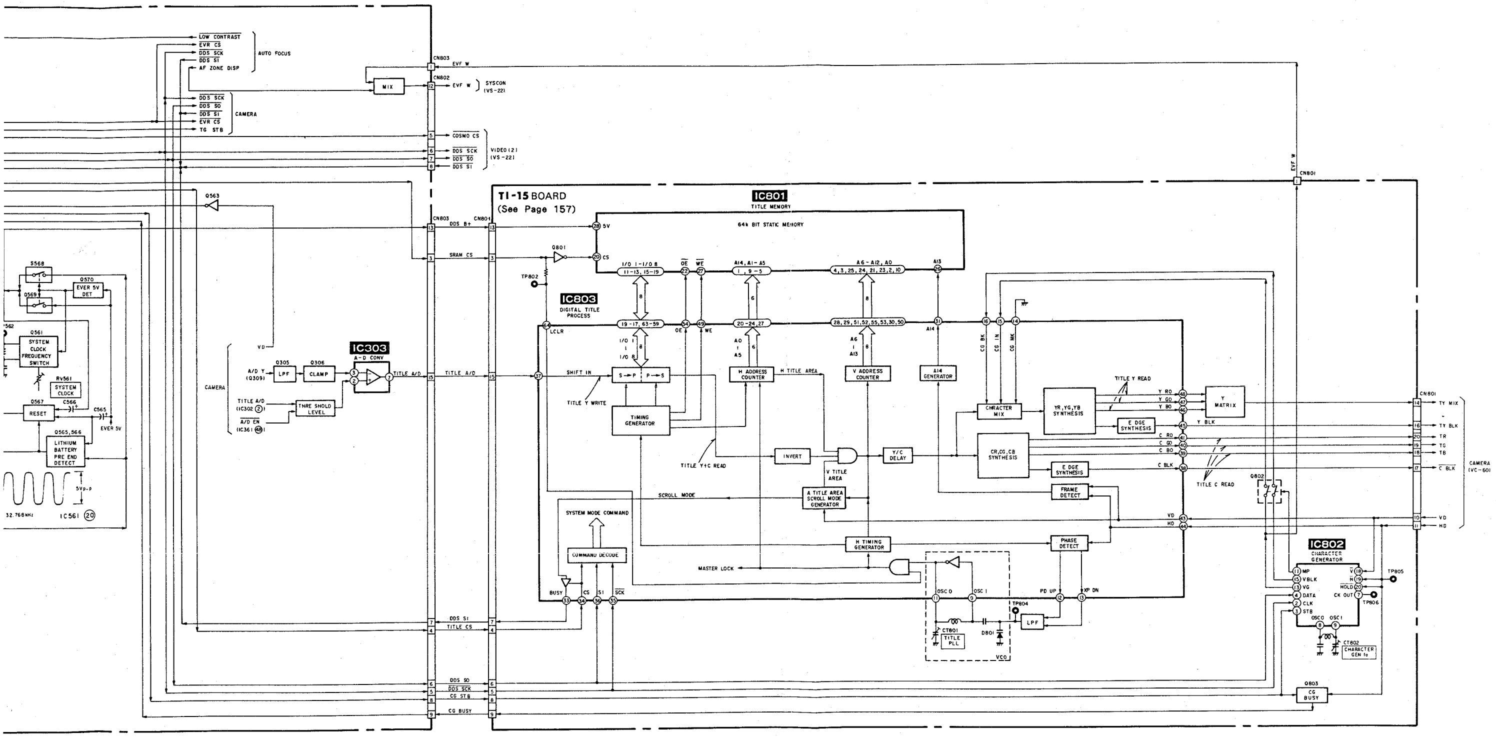

VC-60 BOARD (AUTO FOCUS)
(See Page 133)
CAMERA
IRIS CONT (Q102)
MAX GAIN
V SUB CONT
AGC REF
MACRO (IC361 ⑮)
AF CLK (4FSC) (Q142)
(DT-74 ⑦) VD(2)
(DT-74 ⑧) HD(2)
AGC CONT(3) (Q107)
YH (AF) (Q195)
Q613
HPF 1
Q614
HPF 2
Q619
AMP
FL610
LPF
Q620,621
RECT
IC612
AF PROCESS
CKP
MC IN
VD
HD
SO IN
2 TO 1 ANALOG SW
S1 IN
SWOT
ADRF
ANI 0
ANI 1
ANI 2
ANI 3
ANI 4
ANI 5
7 LINE TO 1 LINE DATA MULTIPLEXER
HALL OUT
AGC CONT
N.C
IP SG
AF ZONE DISP
MCO 8
AREA
XCS
SCK
S1
SO
XRST
ADI0
ADI5
ADCK
ADCV
IC614
V IN
CLK
A/D CONVERTER
D0
D5
(IC615 ⑦) REF 2V
(IC615 ①) REF 1V
VRT
VRB
IC615
AD REF
5V
REF 2V
REF 1V
CAM 5V
Q612
SYSTEM CONTROL (VS-22)
SYSTEM RESET
CN802
Q610 (1/2)
DIGITAL TITLE
DDS S1
DDS SCK
LOW CONTRAST
EVR CS
AF ZONE DISP
IC613
AUTO FOCUS CPU
MACRO
CLK IN
AREA
XCS
SCK
MOSI
MISO
SYS RST
EVR CS
LOW CONTRAST
J STB
AFSSW
DASTB
CAM 5V
FSPD 3
FSPD 2
FSPD 1
FSPD 0
FOCUS N
FOCUS ∞
FOCUS FG
SS OUT
SS
ZOOM T
ZOOM W
FOCUS ∞
FOCUS N
IC611
EVR
LD
D1
CLK
IRIS
FOCUS SPEED
HALL OFFSET
MAX GAIN
AGC REF
V SUB CONT
N.C
Q611
BUFFER
ZP
REF 1V (IC615 ⑦)
REF 2V (IC615 ①)
IRIS CONT
CN805
W701
LD-11 BOARD (See Page
REF 1V
REF 2V
IRIS ADJ
Q708
BUFFER
HALL OS
HALL OUT
IC702
(1/2)
FOCUS SPEED
FOCUS REF
FOCUS N
FOCUS ∞
FOCUS FG
Q707
ZOOM TELE
ZOOM WIDE
FOCUS FAR
FOCUS NEAR
(See Page 193)
FK-9
SWITCH BLOCK
S912
S911
W
T
CN603
W604
CN304
J STB
MOSI
SCK
AF JIG
(See Page 1
VS-22 BO


LD-11 BOARD (See Page 153)
LENS BLOCK
ZOOM POSITION
ZP
REF IV (IC615 ⑦)
REF 2V (IC615 ①)
REF IV
REF 2V
IRIS CONT
CN805
W701
CN705
WP
TP
REF IV (W701 ④)
REF 2V (W701 ⑤)
IC704 (1/2)
IRIS DRIVE
CN702
DRIVE (+)
M904
IRIS MOTOR
CONT (+)
CONT (-)
IC613
AUTO FOCUS CPU
MACRO
Q708
BUFFER
IRIS ADJ
RV701
HALL
IC704 (2/2)
HALL AMP
HALL (+)
HALL (-)
BIAS (+)
REF IV (W701 ④)
REF 2V (W201 ⑤)
IC612
AF PROCESS
CAM 5V
FSPD 3
FSPD 2
FSPD 1
FSPD 0
Q709
HALL OS BUFFER
HALL OS
HALL OUT
PS701
AU UNREG
IC702 (1/2)
Q705, 706
FOCUS REG
Q704
CURRENT DETECT
Q703
CAM 5V DETECT
CAM 5V
IP SG
AF ZONE DISP
FOCUS SPEED
FOCUS REF
Vcc
IC703
AUTO FOCUS MOTOR DRIVE
OUT 1
OUT 2
FOCUS ND
FOCUS FD
CN703
M905 (1/2)
FOCUS MOTOR
2 TO 1 ANALOG SW
MCO 8
AREA
XCS
SCK
SI
SO
XRST
CLK IN
AREA
XCS
SCK
MOSI
MISO
SYS RST
EVR CS
LOW CONTRAST
J STB
FOCUS N
FOCUS ∞
IN 1
IN 2
FOCUS FG
Q707
IC702 (2/2)
FG DETECT
P GND
D GND
SS OUT
SS
IC701
Q701, Q702
CURRENT DETECT
ZOOM MOTOR DRIVE
ZOOM W
ZOOM T
M905 (1/2)
ZOOM MOTOR
7 LINE TO 1 LINE DATA MULTIPLEXER
ADIO
ADI5
ZOOM T
ZOOM W
ZOOM TELE
ZOOM WIDE
ADCK
ADCV
IC614
A/D CONVERTER
V IN
CLK
VRT
VRB
D0
D5
(IC615 ⑦) REF 2V
(IC615 ①) REF IV
FOCUS ∞
FOCUS N
FOCUS FAR
FOCUS NEAR
CN704
S901 FOCUS END SWITCH
AFSSW
DASTB
IRIS
Q611
BUFFER
FOCUS SPEED
HALL OFFSET
MAX GAIN
AGC REF
V SUB CONT
LD
DI
CLK
N.C
(See Page 193)
FK-9
SWITCH BLOCK
S912
S911
W
T
CN603
W604
CN802
Q610 (1/2)
IC611
EVR
CN304
J STB
MOSI
SCK
AF JIG
(See Page 181)
VS-22 BOARD

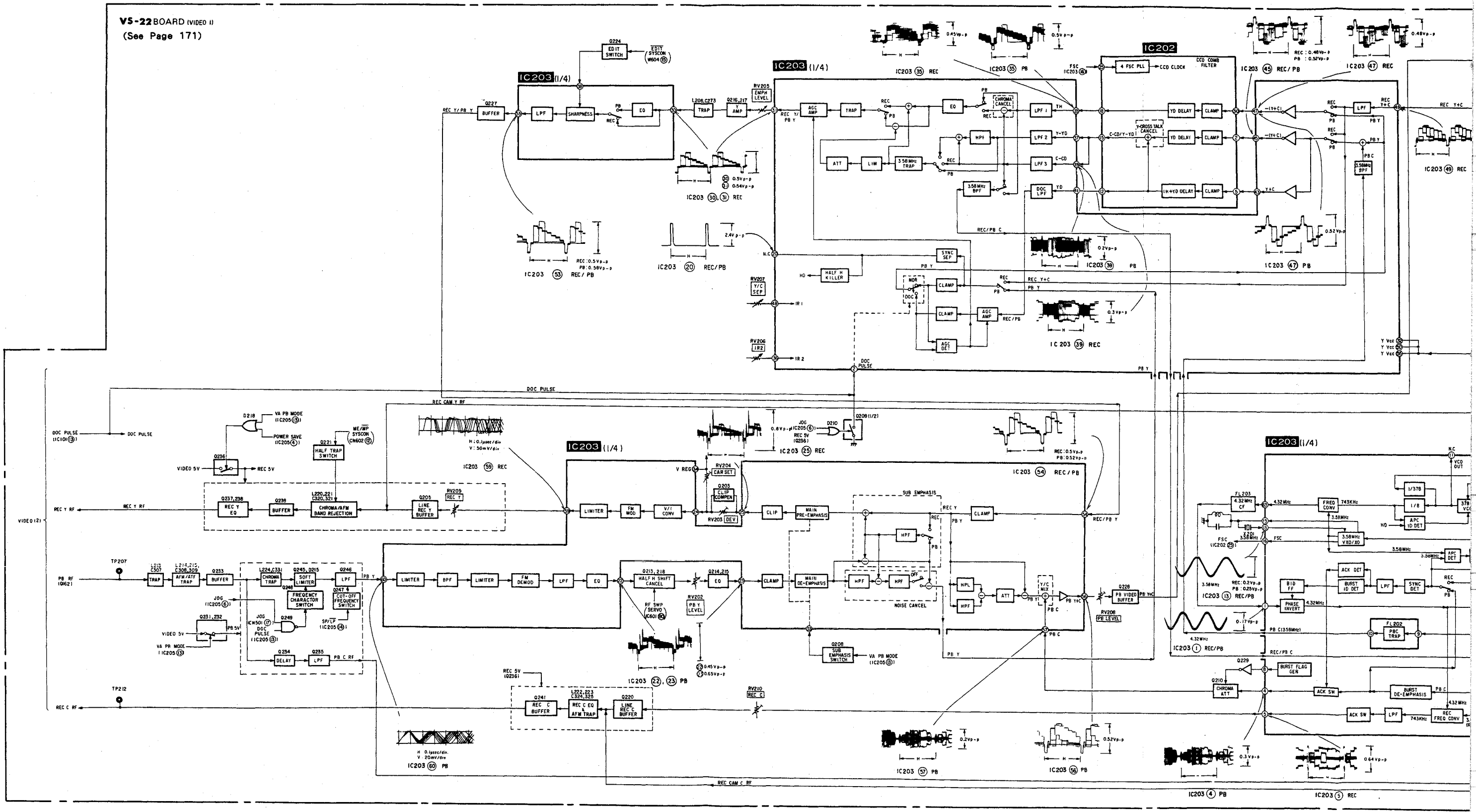
3-5. DIGITAL TAITLLER BLOCK DIAGRAM

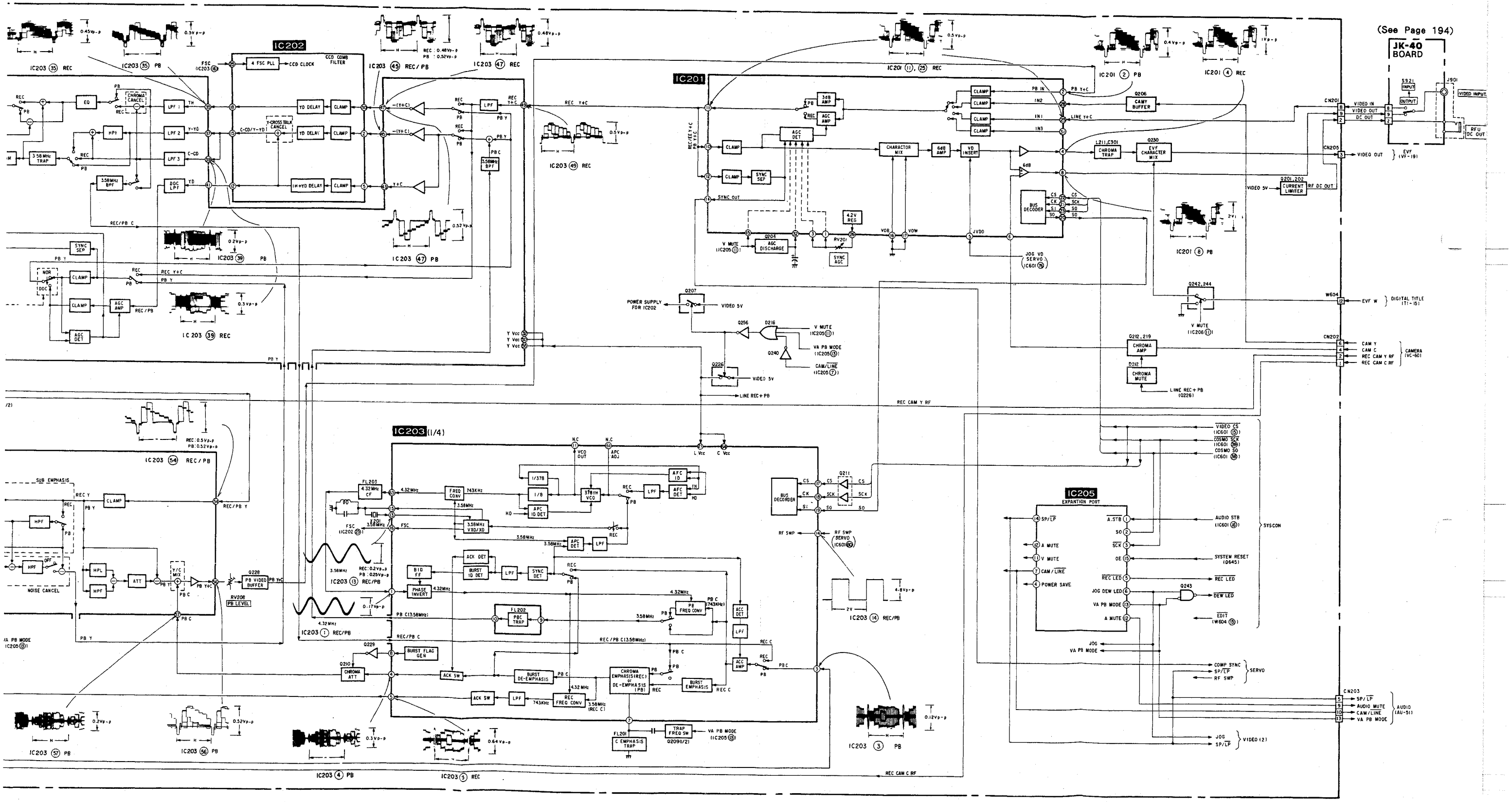


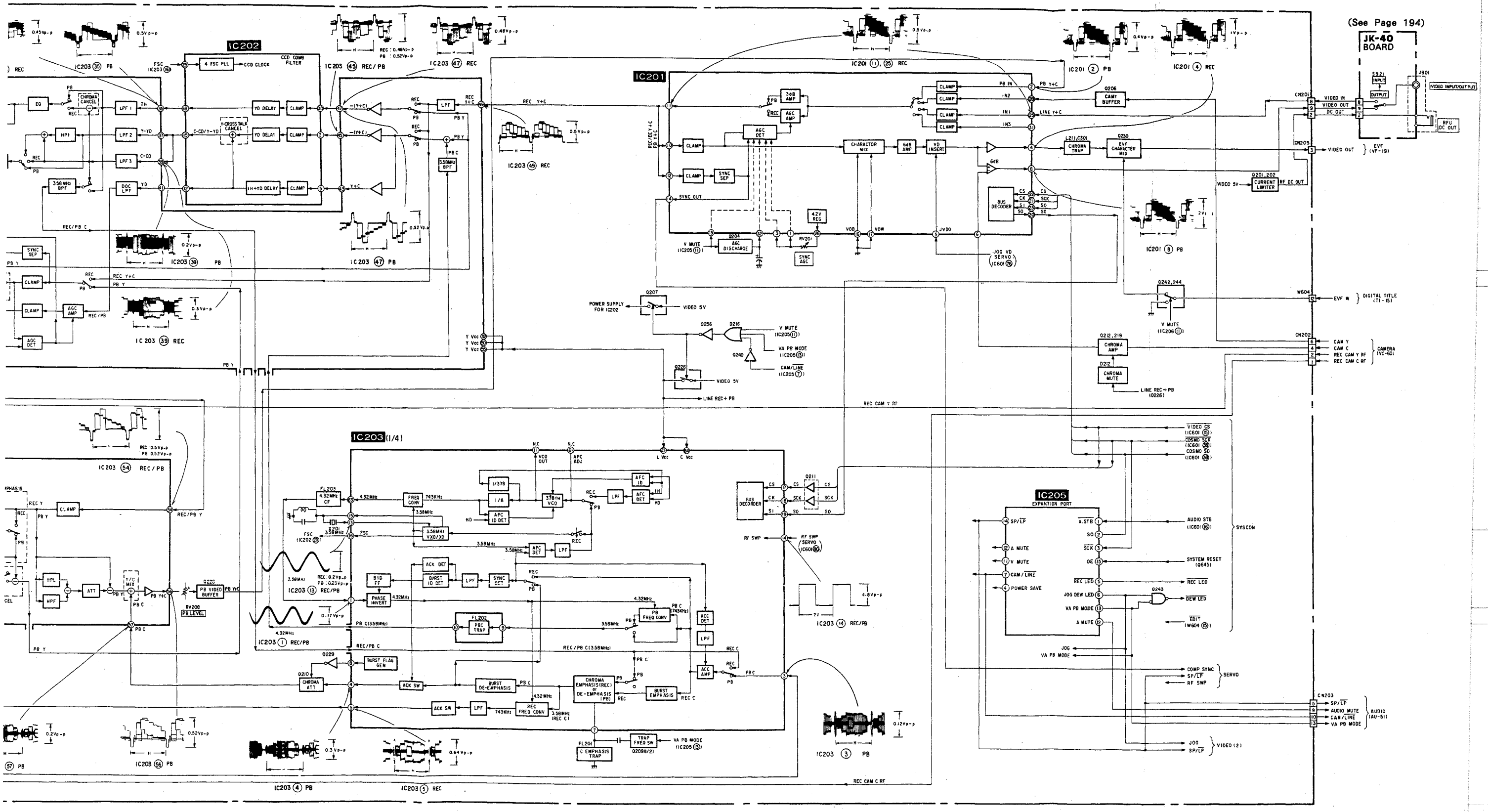
VC-60 BOARD (See Page 133)
CF-4 SWITCH BLOCK (See Page 192)
S765 AUTO LOCK
ON
OFF
S764 FADER
CN751
CN804
AUTO LOCK
FADER SW
Q564 AUTO LOCK SW
Q562(1/2) LOW CONT SW
Q562(1/2) FADER SW
S756 EDITSEARCH (−)
S752 TIME(NEXT)
S763 SUPERIMPOSE COLOR/MODE
S760 SHUTTER SPEED
S755 EDITSEARCH (+)
S751 DATE (+)
S762 SUPERIMPOSE MEMORY
S759 FOCUS
S754 ZERO MEM
S758 BACK LIGHT
S753 RESET
S761 SUPERIMPOSE ON/OFF
S757 WHT BAL
IC561
FEATURE CONTROL (DDS CPU)
CMO 4
CMO 0
CMO 1
CMO 2
CMO 3
CMI 0
CMI 1
CMI 2
CMI 3
EVR CS
TG STB
COSMO CS
DDS SCK
DDS SO
DDS SI
SRAM CS
TITLE CS
INT 1
CG STB
CG BUSY
LCD OFF
LCD POWER INPUT
VLC 3
VLC 2
VLC 1
VDD
S568
S569
Q570 EVER 5V DET
TP562
Q561 SYSTEM CLOCK FREQUENCY SWITCH
RV561 SYSTEM CLOCK
Q567 RESET
C566
C565
EVER 5V
Q565,566 LITHIUM BATTERY PRE END DETECT
CL 2
CL 1
RESET
LIPE
X1
X2
X561 32.78kHz
CT561 CLOCK
32.768kHz
5Vp-p
IC561 ⑳
TP561
S0
S1
S12
COM 0
COM 3
TEST
TP564
CN802
S5.5V
VTR PER
ND751 LIQUID CRYSTAL DISPLAY
CN754
CN806
LC-11 BOARD (See Page 194)
LITHIUM BATTERY
CN753
LI 3V
LOW CONTRAST
EVR CS
DDS SCK
DDS SI
AF ZONE DISP
AUTO FOCUS
DDS SCK
DDS SO
DDS SI
EVR CS
TG STB
CAMERA
MIX
CN803
EVF W
CN802
EVF W
SYSCON (VS-22)
COSMO CS
DDS SCK
DDS SO
DDS SI
VIDEO(2) (VS-22)
Q563
VD
A/D Y (Q309)
Q305 LPF
Q306 CLAMP
IC303 A-D CONV
TITLE A/D
TITLE A/D (IC302 ②)
THRE SHOLD LEVEL
A/D EN (IC361 ㊽)
CAMERA
TI-15 BOARD (See Page 157)
CN803
CN804
DDS B+
SRAM CS
IC801
TITLE MEMORY
64k BIT STATIC MEMORY
5V
CS
Q801
TP802
I/O 1-I/O 8
11-13, 15-19
OE
WE
A14, A1-A5
1, 9-5
A6-A12, A0
4, 3, 25, 24, 21, 23, 2, 10
IC803
DIGITAL TITLE PROCESS
LCLR
19-17, 63-59
20-24, 27
28, 29, 51, 52, 55, 53, 30, 50
I/O 1
I/O 8
A0
A5
A6
A13
SHIFT IN
S→P
P→S
TITLE Y WRITE
TIMING GENERATOR
H ADDRESS COUNTER
H TITLE AREA
V ADDRESS COUNTER
INVERT
Y/C DELAY
TITLE Y+C READ
V TITLE AREA
SCROLL MODE
A TITLE AREA SCROLL MODE GENERATOR
SYSTEM MODE COMMAND
COMMAND DECODE
H TIMING GENERATOR
MASTER LOCK
BUSY
CS
SI
SCK
DDS SI
TITLE CS
DDS SO
DDS SCK
CG STB
CG BUSY

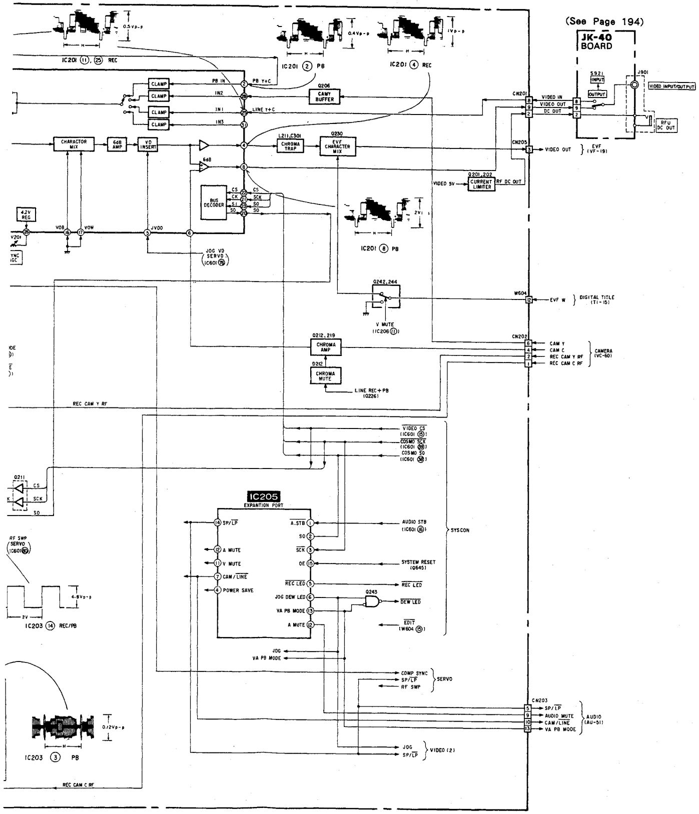

LOW CONTRAST
EVR CS
DDS SCK
DDS SI
AF ZONE DISP
AUTO FOCUS
DDS SCK
DDS SO
DDS SI
EVR CS
TG STB
CAMERA
MIX
CN803
EVF W
CN802
EVF W
SYSCON (VS-22)
COSMO CS
DDS SCK
DDS SO
DDS SI
VIDEO (2) (VS-22)
Q563
S568
Q570
EVER 5V DET
Q569
Q561
SYSTEM CLOCK FREQUENCY SWITCH
RV561
SYSTEM CLOCK
Q567
C566
C565
RESET
EVER 5V
Q565,566
LITHIUM BATTERY PRE END DETECT
5Vp-p
32.768kHz
IC561 ⑳
VD
CAMERA
A/D Y (Q309)
Q305
LPF
Q306
CLAMP
IC303
A-D CONV
TITLE A/D
TITLE A/D (IC302 ②)
A/D EN (IC361 ㊽)
THRE SHOLD LEVEL
CN803
DDS 8+
SRAM CS
TITLE A/D
CN801
TI-15 BOARD
(See Page 157)
IC801
TITLE MEMORY
64k BIT STATIC MEMORY
5V
CS
Q801
TP802
I/O 1-I/O 8
11-13, 15-19
OE
WE
A14, A1-A5
1, 9-5
A6-A12, A0
4, 3, 25, 24, 21, 23, 2, 10
A13
IC803
DIGITAL TITLE PROCESS
LCLR
19-17, 63-59
OE
WE
20-24, 27
28, 29, 51, 52, 55, 53, 30, 50
A14
I/O 1 I/O 8
A0 A5
A6 A13
SHIFT IN
S→P
P→S
TITLE Y WRITE
TIMING GENERATOR
H ADDRESS COUNTER
H TITLE AREA
V ADDRESS COUNTER
A14 GENERATOR
CG BK
CG IN
CG MK
TITLE Y READ
CHRACTER MIX
YR, YG, YB SYNTHESIS
Y MATRIX
Y R0
Y G0
Y B0
E DGE SYNTHESIS
Y BLK
INVERT
Y/C DELAY
CR, CG, CB SYNTHESIS
C R0
C G0
C B0
C BLK
E DGE SYNTHESIS
TITLE Y+C READ
TITLE C READ
V TITLE AREA
A TITLE AREA SCROLL MODE GENERATOR
SCROLL MODE
FRAME DETECT
SYSTEM MODE COMMAND
COMMAND DECODE
VD
HD
H TIMING GENERATOR
PHASE DETECT
MASTER LOCK
BUSY
CS
SI
SCK
OSC O
OSC I
PD UP
XP DN
TP804
LPF
CT801
TITLE PLL
D801
VCO
DDS SI
TITLE CS
DDS SO
DDS SCK
CG STB
CG BUSY
EVF W
CN801
TY MIX
TY BLK
TR
TG
TB
C BLK
VD
HD
CAMERA (VC-60)
Q802
IC802
CHARACTER GENERATOR
MP
VBLK
VG
DATA
CLK
STB
V
H
HOLD
CK OUT
TP805
TP806
OSC O
OSC I
CT802
CHARACTER GEN fo
Q803
CG BUSY

3-6. VIDEO BLOCK DIAGRAM (1)

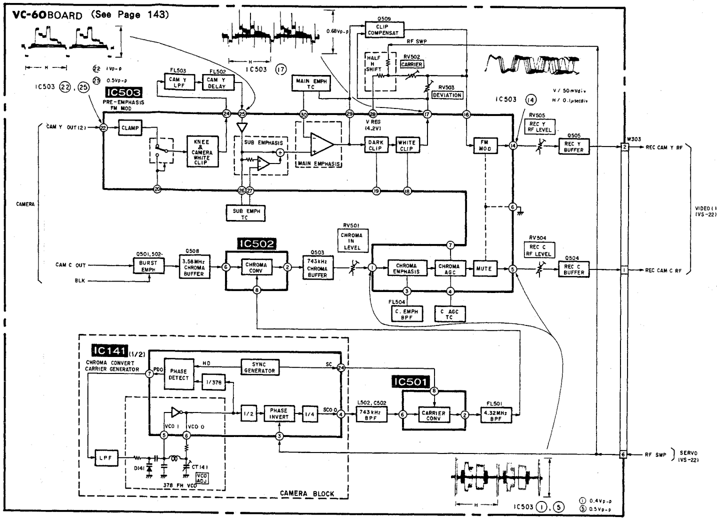

VS-22 BOARD (VIDEO I)
(See Page 171)
IC203 (1/4)
IC202
Q224 EDIT SWITCH
EDIT SYSCON (W604 ⑮)
Q227 BUFFER
REC Y/PB Y
LPF
SHARPNESS
EQ
L206,C273 TRAP
Q216,217 Y AMP
RV205 EMPH LEVEL
AGC AMP
TRAP
ATT
LIM
3.58MHz TRAP
3.58MHz BPF
CHROMA CANCEL
HPF
LPF 1
LPF 2
LPF 3
DOC LPF
4 FSC PLL
CCD CLOCK
CCD COMB FILTER
Y-CROSS TALK CANCEL
YD DELAY
CLAMP
1H+YD DELAY
C-CD/Y-YD
REC Y+C
3.58MHz BPF
SYNC SEP
HALF H KILLER
RV207 Y/C SEP
RV206 IR2
NOR
DOC
AGC AMP
AGC DET
DOC PULSE
IC203 ㊸ REC/PB
IC203 ㊼ REC
IC203 ㊸ PB
IC203 ㊹ REC
IC203 ㉚, ㉛ REC
IC203 ㊳ REC/PB
IC203 ⑳ REC/PB
IC203 ㊴ PB
IC203 ㊴ REC
IC203 ㊼ PB
Y Vcc
DOC PULSE (IC101 ⑬)
D218
VA PB MODE (IC205 ⑬)
POWER SAVE (IC205 ④)
Q256
VIDEO 5V
REC 5V
Q221 HALF TRAP SWITCH
ME/MP SYSCON (CN602 ⑫)
Q237,238 REC Y EQ
Q239 BUFFER
L220,221 C320,321 CHROMA/AFM BAND REJECTION
Q205 LINE REC Y BUFFER
RV209 REC Y
REC Y RF
REC CAM Y RF
IC203 ㊾ REC
LIMITER
FM MOD
V/I CONV
V REG
RV204 CAR SET
Q203 CLIP COMPEN
RV203 DEV
CLIP
MAIN PRE-EMPHASIS
SUB EMPHASIS
CLAMP
IC203 ㉕ REC
IC203 ㊹ REC/PB
JOG IC205 ⑥
D210
Q209 (1/2)
REC 5V (Q236)
VIDEO (2)
TP207
PB RF (Q162)
L213 C307 TRAP
L214,215, C308,309 AFM/ATF TRAP
Q233 BUFFER
L224,C331 CHROMA TRAP
Q245,D215 SOFT LIMITER
Q248 FREQENCY CHARACTOR SWITCH
Q246 LPF
Q247 CUT-OFF FREQUENCY SWITCH
SP/LP (IC205 ⑭)
JOG (IC205 ⑥)
Q231,232
PB 5V
JOG CN501 ⑰
DOC PULSE (IC205 ⑬)
Q249
VA PB MODE (IC205 ⑬)
Q234 DELAY
Q235 LPF
PB C RF
BPF
FM DEMOD
Q213,218 HALF H SHIFT CANCEL
Q214,215 EQ
RF SWP SERVO (IC601 ㊿)
RV202 PB Y LEVEL
IC203 ㉒, ㉓ PB
MAIN DE-EMPHASIS
NOISE CANCEL
NPL
ATT
Y/C MIX
Q228 PB VIDEO BUFFER
RV208 PB LEVEL
Q208 SUB EMPHASIS SWITCH
VA PB MODE (IC205 ⑬)
TP212
REC C RF
REC 5V (Q236)
Q241 REC C BUFFER
L222,223 C324,325 REC C EQ AFM TRAP
Q220 LINE REC C BUFFER
RV210 REC C
REC CAM C RF
IC203 ㊿ PB
IC203 ㊼ PB
IC203 ㊻ PB
IC203 ④ PB
IC203 ⑤ REC
FL203 4.32MHz CF
X201 3.58MHz
FSC (IC202 ㉓)
FREQ CONV
743KHz
3.58MHz VXO/XO
1/378
1/8
APC ID DET
APC DET
ACK DET
BURST ID DET
BID FF
PHASE INVERT
SYNC DET
FL202 PBC TRAP
IC203 ⑬ REC/PB
IC203 ① REC/PB
Q229
BURST FLAG GEN
Q210 CHROMA ATT
ACK SW
BURST DE-EMPHASIS
REC FREQ CONV
PB C(358MHz)
REC/PB C


(See Page 194)
JK-40 BOARD
S921 INPUT OUTPUT
J901 VIDEO INPUT
RFU DC OUT
IC202
4 FSC PLL
CCD CLOCK
CCD COMB FILTER
YD DELAY
CLAMP
Y-CROSS TALK CANCEL
1H+YD DELAY
CHROMA CANCEL
EQ
HPF
LPF 1
LPF 2
LPF 3
3.58MHz TRAP
3.58MHz BPF
DOC LPF
FSC (IC203 ⑯)
IC203 ㉟ REC
IC203 ㉟ PB
IC203 ㊺ REC/PB
IC203 ㊼ REC
IC203 ㊼ PB
IC203 ㊾ REC
IC203 ㊴ PB
IC203 ㊴ REC
REC: 0.48Vp-p
PB: 0.52Vp-p
SYNC SEP
CLAMP
AGC AMP
AGC DET
NOR
DOC
Y Vcc
IC201
3dB AMP
AGC AMP
AGC DET
CHARACTOR MIX
6dB AMP
VD INSERT
BUS DECODER
SYNC SEP
4.2V REG
AGC DISCHARGE
SYNC AGC
RV201
JOG VD SERVO (IC601 ⑯)
IC201 ⑪, ㉕ REC
IC201 ② PB
IC201 ④ REC
IC201 ⑧ PB
PB IN
IN1
IN2
IN3
LINE Y+C
CAMY BUFFER
Q206
L211, C301 CHROMA TRAP
Q230 EVF CHARACTER MIX
Q201,202 CURRENT LIMITER
RF DC OUT
VIDEO 5V
CN201
VIDEO IN
VIDEO OUT
DC OUT
CN205
VIDEO OUT
EVF (VF-19)
W604
EVF W
DIGITAL TITLE (TT-15)
CN202
CAM Y
CAM C
REC CAM Y RF
REC CAM C RF
CAMERA (VC-60)
Q242,244
Q212,219 CHROMA AMP
D212 CHROMA MUTE
LINE REC+PB (Q226)
Q207
POWER SUPPLY FOR IC202
Q256
D216
Q240
Q226
V MUTE (IC205 ⑪)
VA PB MODE (IC205 ⑬)
CAM/LINE (IC205 ⑦)
REC CAM Y RF
VIDEO CS (IC601 ⑮)
COSMO SCK (IC601 ㊴)
COSMO SO (IC601 ㊳)
IC203 (1/4)
FL203 4.32MHz CF
FREQ CONV
1/378
1/8
378fH VCO
AFC ID
AFC DET
APC ID DET
3.58MHz VXO/XO
APC DET
LPF
X201 3.58MHz
ACK DET
BID FF
BURST ID DET
SYNC DET
PHASE INVERT
FL202 PBC TRAP
PB FREQ CONV
ACC DET
ACC AMP
BURST FLAG GEN
CHROMA ATT
ACK SW
BURST DE-EMPHASIS
REC FREQ CONV
CHROMA EMPHASIS (REC) or DE-EMPHASIS (PB)
BURST EMPHASIS
FL201 C EMPHASIS TRAP
TRAP FREQ SW
Q209(1/2)
BUS DECODER
Q211
RF SWP
RF SWP SERVO (IC601 ㊷)
IC203 ⑭ REC/PB
IC203 ③ PB
IC203 ④ PB
IC203 ⑤ REC
IC203 ⑬ REC/PB
IC203 ① REC/PB
IC203 ㊿ REC/PB
IC203 (57) PB
IC203 (56) PB
SUB EMPHASIS
NOISE CANCEL
ATT
Y/C MIX
Q228 PB VIDEO BUFFER
RV206 PB LEVEL
VA PB MODE (IC205 ⑬)
IC205
EXPANTION PORT
SP/LP
A MUTE
V MUTE
CAM/LINE
POWER SAVE
A.STB
SO
SCK
OE
REC LED
JOG DEW LED
VA PB MODE
A MUTE
AUDIO STB (IC601 ⑯)
SYSTEM RESET (Q645)
SYSCON
Q243
DEW LED
EDIT (W604 ⑮)
JOG
VA PB MODE
COMP SYNC
SP/LP
RF SWP
SERVO
CN203
AUDIO MUTE
CAM/LINE
AUDIO (AU-51)
VIDEO (2)
REC CAM C RF

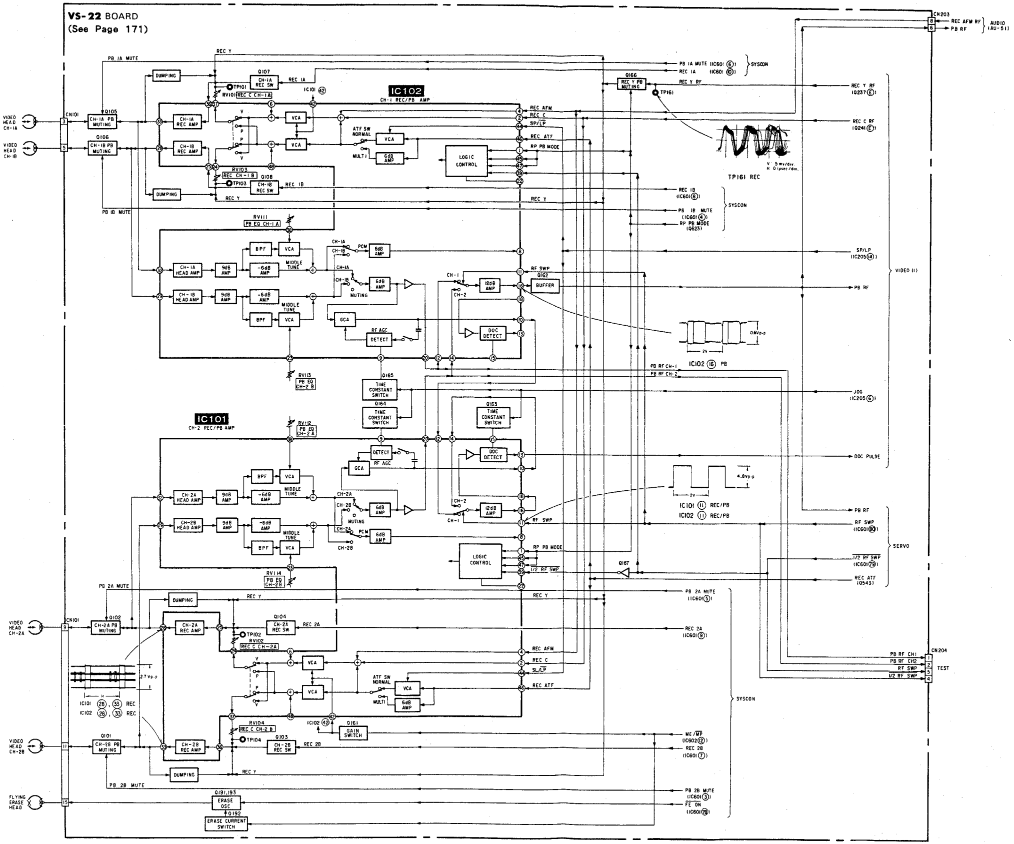

(See Page 194)
JK-40 BOARD
S921 INPUT
OUTPUT
J901 VIDEO INPUT/OUTPUT
RFU DC OUT
IC202
CCD COMB FILTER
4 FSC PLL
CCD CLOCK
YD DELAY
CLAMP
Y-CROSS TALK CANCEL
1H+YD DELAY
LPF 1
LPF 2
LPF 3
DOC LPF
EQ
HPI
CHROMA CANCEL
3.58MHz BPF
SYNC SEP
AGC AMP
AGC DET
IC201
36B AMP
AGC DET
CHARACTOR MIX
6dB AMP
VD INSERT
BUS DECODER
Q204 AGC DISCHARGE
4.2V REG
SYNC AGC
RV201
Q206 CAMY BUFFER
L211,C301 CHROMA TRAP
Q230 EVF CHARACTER MIX
Q201,202 CURRENT LIMITER
RF DC OUT
VIDEO IN
VIDEO OUT
DC OUT
CN201
CN205
VIDEO OUT
EVF (VF-19)
W604
EVF W
DIGITAL TITLE (T1-15)
Q242,244
Q212,219 CHROMA AMP
D212 CHROMA MUTE
LINE REC+PB (Q226)
CN202
CAM Y
CAM C
REC CAM Y RF
REC CAM C RF
CAMERA (VC-60)
Q207
POWER SUPPLY FOR IC202
VIDEO 5V
Q256
D216
Q240
V MUTE (IC205 ⑪)
VA PB MODE (IC205 ⑬)
CAM/LINE (IC205 ⑦)
Q226
LINE REC+PB
REC CAM Y RF
IC203 (1/4)
FL203 4.32MHz CF
FREQ CONV
1/378
1/8
APC ID DET
378fH VCO
AFC ID
AFC DET
LPF
3.58MHz VXO/XO
APC DET
ACK DET
BID FF
BURST ID DET
SYNC DET
PHASE INVERT
FL202 PBC TRAP
PB FREQ CONV
ACC DET
BURST FLAG GEN
ACK SW
BURST DE-EMPHASIS
CHROMA EMPHASIS(REC) or DE-EMPHASIS (PB)
BURST EMPHASIS
ACC AMP
REC FREQ CONV
FL201 C EMPHASIS TRAP
TRAP FREQ SW Q209(1/2)
BUS DECODER
Q211
Q229
Q210 CHROMA ATT
Q220 PB VIDEO BUFFER
RV206 PB LEVEL
CLAMP
HPL
HPF
ATT
Y/C MIX
IC205 EXPANTION PORT
SP/LP
A MUTE
V MUTE
CAM/LINE
POWER SAVE
A.STB
SO
SCK
OE
REC LED
JOG DEW LED
VA PB MODE
A MUTE
Q243
AUDIO STB (IC601 ⑯)
SYSTEM RESET (Q645)
REC LED
DEW LED
EDIT (W604 ⑮)
SYSCON
VIDEO CS (IC601 ⑮)
COSMO SCK (IC601)
COSMO SO (IC601)
JOG
VA PB MODE
COMP SYNC
SP/LP
RF SWP
SERVO
CN203
SP/LP
AUDIO MUTE
CAM/LINE
VA PB MODE
AUDIO (AU-51)
JOG
SP/LP
VIDEO(2)
RF SWP (SERVO IC601)
JOG VD SERVO (IC601)
REC CAM C RF
IC203 ㉟ PB
IC203 ㊺ REC/PB
IC203 ㊼ REC
IC201 ⑪, ㉕ REC
IC201 ② PB
IC201 ④ REC
IC203 ㊾ REC
IC203 ㊴ PB
IC203 ㊼ PB
IC203 ㊴ REC
IC201 ⑧ PB
IC203 (54) REC/PB
IC203 ⑬ REC/PB
IC203 ① REC/PB
IC203 ⑭ REC/PB
IC203 ③ PB
IC203 ④ PB
IC203 ⑤ REC
IC203 (56) PB
(57) PB
0.45Vp-p
0.5Vp-p
REC: 0.48Vp-p PB: 0.52Vp-p
0.48Vp-p
0.5Vp-p
0.4Vp-p
1Vp-p
0.5Vp-p
2Vp-p
0.52Vp-p
0.2Vp-p
0.3Vp-p
REC: 0.5Vp-p PB: 0.52Vp-p
REC: 0.2Vp-p PB: 0.25Vp-p
0.17Vp-p
4.8Vp-p
0.12Vp-p
0.3Vp-p
0.64Vp-p
0.2Vp-p
0.52Vp-p
3.58MHz
4.32MHz
743KHz


0.5Vp-p
H
IC201 ⑪, ㉕ REC
0.4Vp-p
IC201 ② PB
1Vp-p
IC201 ④ REC
(See Page 194)
JK-40 BOARD
S921
INPUT
OUTPUT
J901
VIDEO INPUT/OUTPUT
RFU DC OUT
CN201
VIDEO IN
VIDEO OUT
DC OUT
CN205
VIDEO OUT
EVF (VF-19)
PB IN
PB Y+C
IN2
IN1
IN3
LINE Y+C
CLAMP
Q206
CAMY BUFFER
CHARACTOR MIX
6dB AMP
VD INSERT
6dB
L211,C301
CHROMA TRAP
Q230
EVF CHARACTER MIX
BUS DECODER
CS
CK
SI
SO
SCK
4.2V REG
V201
VOB
VOW
JVDO
JOG VD SERVO (IC601 ⑯)
Q201,202
CURRENT LIMITER
VIDEO 5V
RF DC OUT
2V
IC201 ⑧ PB
Q242,244
V MUTE (IC206 ⑪)
W604
EVF W
DIGITAL TITLE (TI-15)
Q212,219
CHROMA AMP
D212
CHROMA MUTE
LINE REC+PB (Q226)
CN202
CAM Y
CAM C
REC CAM Y RF
REC CAM C RF
CAMERA (VC-60)
REC CAM Y RF
VIDEO CS (IC601 ⑮)
COSMO SCK (IC601 (59))
COSMO SO (IC601 (58))
Q211
IC205
EXPANTION PORT
⑭ SP/LP
⑫ A MUTE
⑪ V MUTE
⑦ CAM/LINE
④ POWER SAVE
A.STB ①
SO ②
SCK ③
OE ⑮
REC LED ⑤
JOG DEW LED ⑥
VA PB MODE ⑬
A MUTE ⑫
AUDIO STB (IC601 ⑯)
SYSTEM RESET (Q645)
REC LED
Q243
DEW LED
EDIT (W604 ⑮)
SYSCON
RF SWP SERVO (IC601 (80))
4.8Vp-p
2V
IC203 ⑭ REC/PB
JOG
VA PB MODE
COMP SYNC
SP/LP
RF SWP
SERVO
CN203
SP/LP
AUDIO MUTE
CAM/LINE
VA PB MODE
AUDIO (AU-51)
0.12Vp-p
IC203 ③ PB
JOG
SP/LP
VIDEO (2)
REC CAM C RF

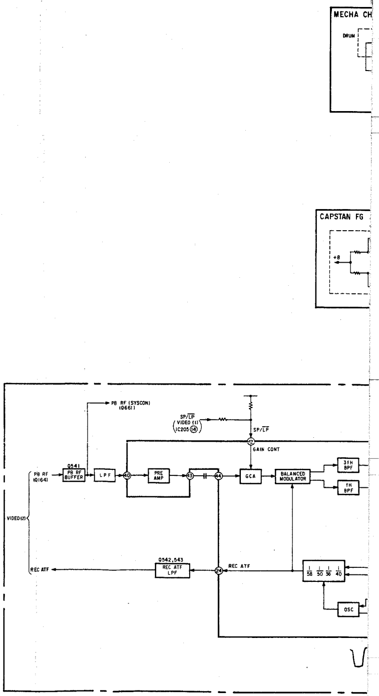
3-7. CAMERA REC BLOCK DIAGRAM


VC-60BOARD (See Page 143)
H
㉒ 1Vp-p
㉕ 0.5Vp-p
IC503 ㉒, ㉕
0.68Vp-p
IC503 ⑰
IC503
PRE-EMPHASIS FM MOD
CAM Y OUT (2)
CAMERA
CLAMP
KNEE & CAMERA WHITE CLIP
FL503
CAM Y LPF
FL502
CAM Y DELAY
SUB EMPHASIS
SUB EMPH TC
MAIN EMPH TC
MAIN EMPHASIS
Q509
CLIP COMPENSAT
RF SWP
HALF H SHIFT
RV502
CARRIER
RV503
DEVIATION
V REG (4.2V)
DARK CLIP
WHITE CLIP
FM MOD
IC503 ⑭
V / 50mVdiv
H / 0.1μsecdiv
RV505
REC Y RF LEVEL
Q505
REC Y BUFFER
W303
REC CAM Y RF
VIDEO (1) (VS-22)
CAM C OUT
BLK
Q501,502
BURST EMPH
Q508
3.58MHz CHROMA BUFFER
IC502
CHROMA CONV
Q503
743kHz CHROMA BUFFER
RV501
CHROMA IN LEVEL
CHROMA EMPHASIS
CHROMA AGC
MUTE
FL504
C. EMPH BPF
C AGC TC
RV504
REC C RF LEVEL
Q504
REC C BUFFER
REC CAM C RF
IC141 (1/2)
CHROMA CONVERT CARRIER GENERATOR
PDO
PHASE DETECT
HD
SYNC GENERATOR
SC
1/378
1/2
PHASE INVERT
1/4
SCO O
VCO I
VCO O
LPF
D141
CT141
VCO ADJ
378 FH VCO
CAMERA BLOCK
IC501
L502, C502
743kHz BPF
CARRIER CONV
FL501
4.32MHz BPF
RF SWP
SERVO (VS-22)
IC503 ①, ⑤
① 0.4Vp-p
⑤ 0.5Vp-p

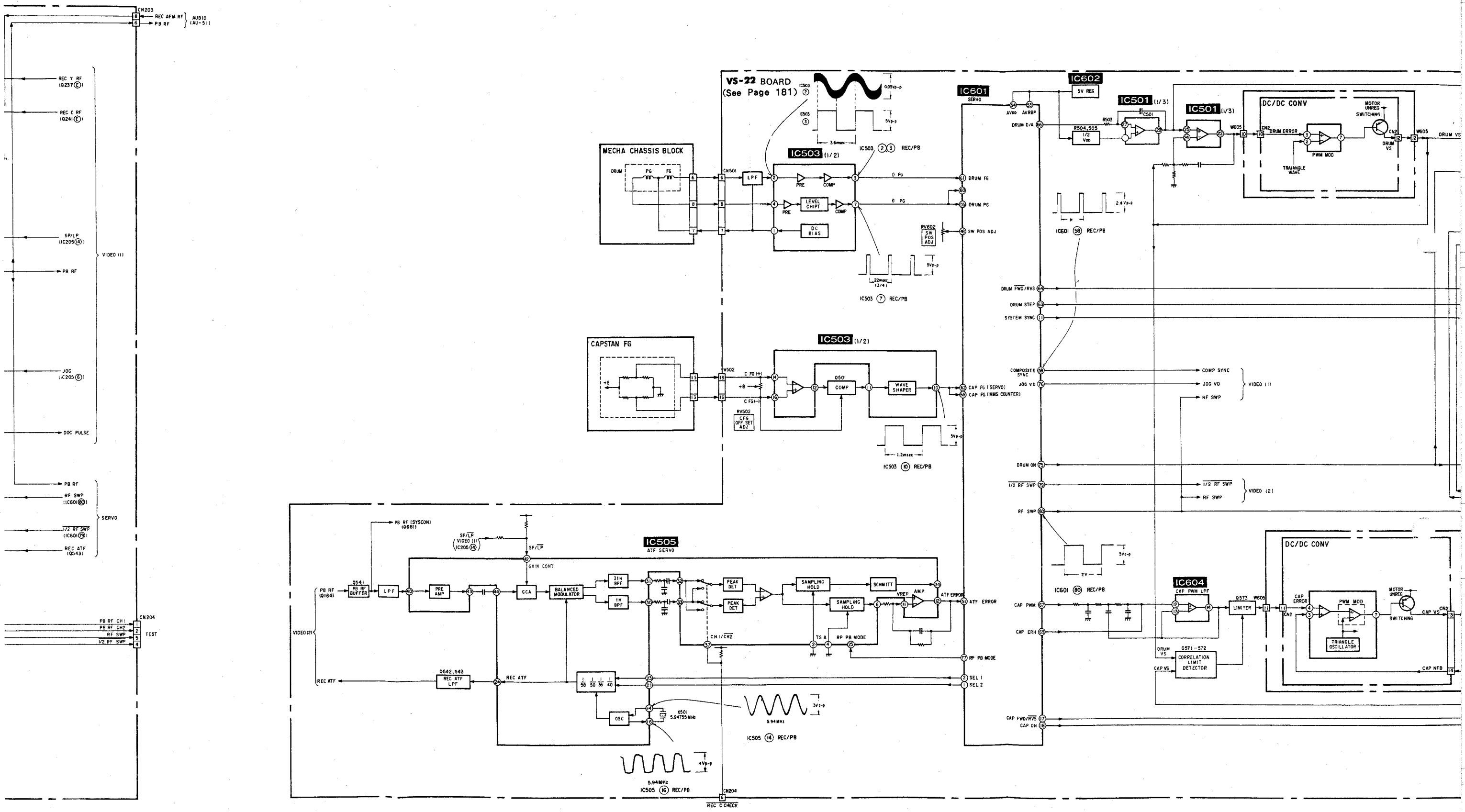
3-8. VIDEO BLOCK DIAGRAM (2)


VS-22 BOARD
(See Page 171)
VIDEO HEAD CH-1A
VIDEO HEAD CH-1B
VIDEO HEAD CH-2A
VIDEO HEAD CH-2B
FLYING ERASE HEAD
CN101
3
5
9
11
15
PB 1A MUTE
PB 1B MUTE
PB 2A MUTE
PB 2B MUTE
Q105
CH-1A PB MUTING
Q106
CH-1B PB MUTING
Q102
CH-2A PB MUTING
Q101
CH-2B PB MUTING
DUMPING
REC Y
Q107
CH-1A REC SW
REC 1A
TP101
RV101 REC C CH-1A
IC101 42
IC102
CH-1 REC/PB AMP
CH-1A REC AMP
CH-1B REC AMP
V
P
VCA
ATF SW NORMAL
MULTI
6dB AMP
LOGIC CONTROL
REC AFM
REC C
SP/LP
REC ATF
RP PB MODE
RV103 REC CH-1B
TP103
Q108
CH-1B REC SW
REC 1B
RV111 PB EQ CH-1A
BPF
CH-1A HEAD AMP
CH-1B HEAD AMP
9dB AMP
-6dB AMP
MIDDLE TUNE
CH-1A
CH-1B
PCM
MUTING
CH-1
CH-2
12dB AMP
RF SWP
Q162
BUFFER
GCA
RF AGC
DETECT
DOC DETECT
RV113 PB EQ CH-2B
Q165
TIME CONSTANT SWITCH
Q164
TIME CONSTANT SWITCH
Q163
TIME CONSTANT SWITCH
IC101
CH-2 REC/PB AMP
RV112 PB EQ CH-2A
CH-2A HEAD AMP
CH-2B HEAD AMP
CH-2A
CH-2B
1/2 RF SWP
RV114 PB EQ CH-2B
Q104
CH-2A REC SW
REC 2A
CH-2A REC AMP
TP102
RV102 REC C CH-2A
SL/LP
CH-2B REC AMP
RV104 REC C CH-2B
TP104
Q103
CH-2B REC SW
REC 2B
IC102 42
Q161
GAIN SWITCH
2.7Vp-p
H
IC101 28, 33 REC
IC102 28, 33 REC
Q191,193
ERASE OSC
Q192
ERASE CURRENT SWITCH
CN203
8
6
REC AFM RF
PB RF
AUDIO (AU-51)
PB 1A MUTE (IC601 6)
REC 1A (IC601 10)
SYSCON
Q166
REC Y PB MUTING
REC Y RF
TP161
REC Y RF (Q237 E)
REC C RF (Q241 E)
V 5mv/div.
H 0.1μsec/div.
TP161 REC
REC 1B (IC601 8)
PB 1B MUTE (IC601 4)
RP PB MODE (Q623)
SYSCON
SP/LP (IC205 14)
VIDEO (1)
PB RF
0.6Vp-p
2V
IC102 16 PB
PB RF CH-1
PB RF CH-2
JOG (IC205 6)
DOC PULSE
4.8Vp-p
2V
IC101 11 REC/PB
IC102 11 REC/PB
PB RF
RF SWP (IC601 80)
1/2 RF SWP (IC601 79)
REC ATF (Q543)
SERVO
Q167
PB 2A MUTE (IC601 5)
REC 2A (IC601 9)
SYSCON
ME/MP (IC602 12)
REC 2B (IC601 7)
PB 2B MUTE (IC601 3)
FE ON (IC601 78)
CN204
PB RF CH1
PB RF CH2
RF SWP
1/2 RF SWP
1
2
5
4
TEST

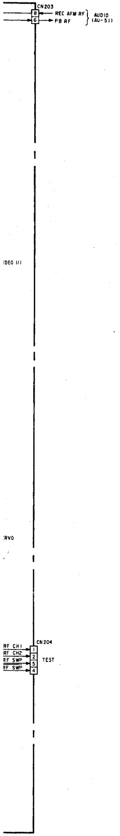
3-9. SERVO BLOCK DIAGRAM


MECHA CH
DRUM
CAPSTAN FG
+B
PB RF (SYSCON) (Q661)
SP/LP VIDEO (1) (IC205 14)
SP/LP
GAIN CONT
VIDEO (2)
PB RF (Q164)
Q541
PB RF BUFFER
LPF
PRE AMP
GCA
BALANCED MODULATOR
31H BPF
fH BPF
REC ATF
Q542,543
REC ATF LPF
REC ATF
1/58 1/50 1/36 1/40
OSC

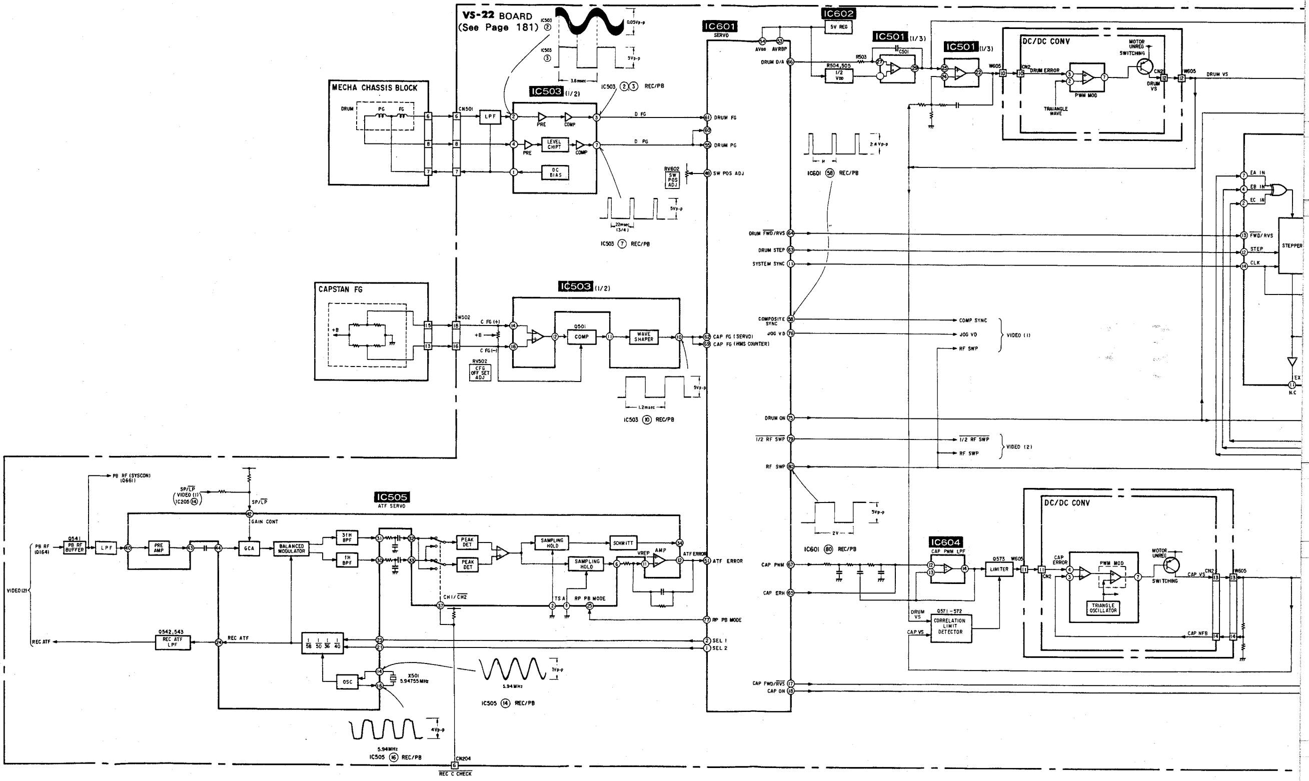
3-9. SERVO BLOCK DIAGRAM

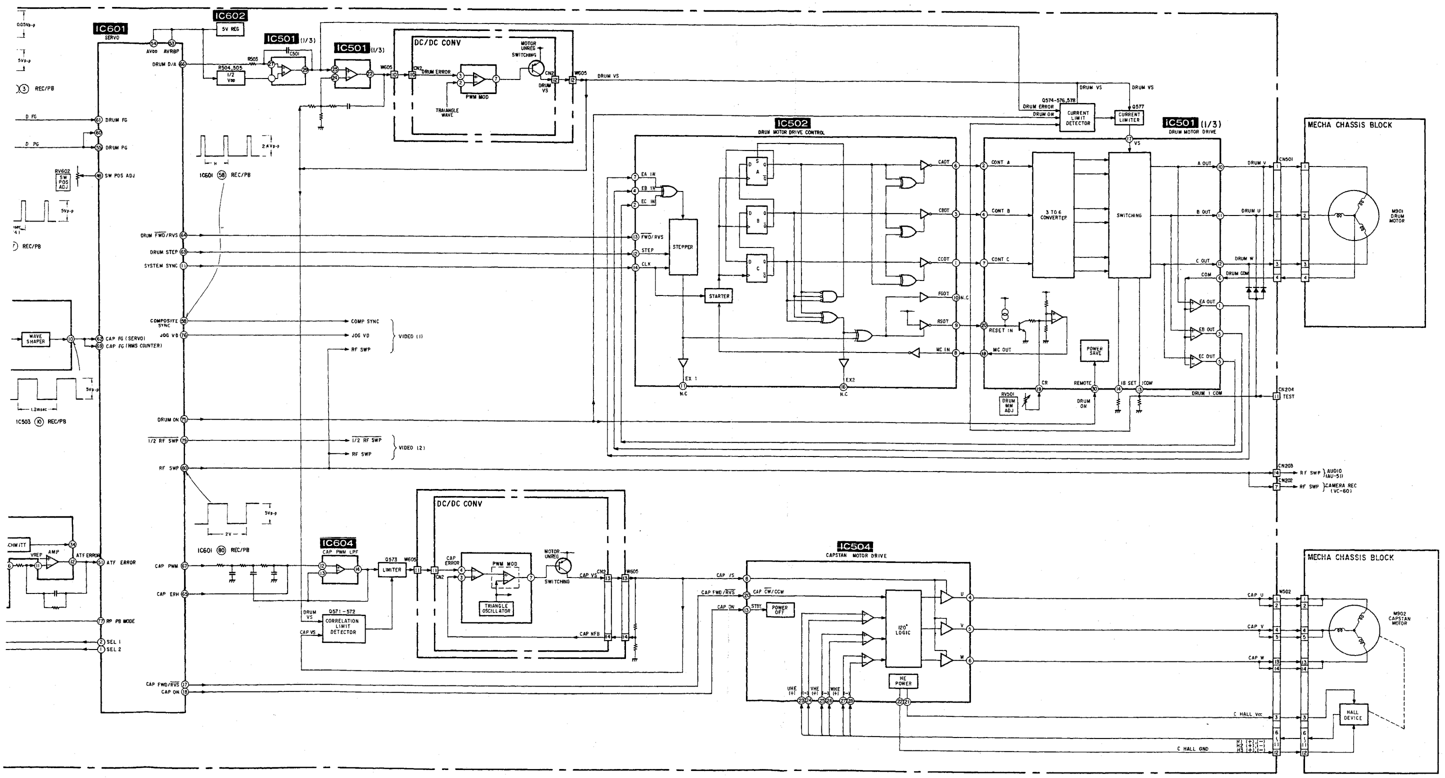


CN203
REC AFM RF
PB RF
AUDIO (AU-51)
REC Y RF (Q237(E))
REC C RF (Q241(E))
SP/LP (IC205(14))
VIDEO (1)
PB RF
JOG (IC205(6))
DOC PULSE
PB RF
RF SWP (IC601(80))
SERVO
1/2 RF SWP (IC601(79))
REC ATF (Q543)
PB RF CH1
PB RF CH2
RF SWP
1/2 RF SWP
CN204
TEST
VS-22 BOARD (See Page 181)
IC503 (2)
0.05Vp-p
IC503 (3)
5Vp-p
3.6msec
IC503 (2)(3) REC/PB
MECHA CHASSIS BLOCK
DRUM
PG
FG
CN501
LPF
IC503 (1/2)
PRE
COMP
LEVEL CHIPT
DC BIAS
D FG
D PG
RV602 SW POS ADJ
22msec (3/4)
IC503 (7) REC/PB
CAPSTAN FG
W502
C FG (+)
+B
C FG (−)
RV502 CFG OFF SET ADJ
IC503 (1/2)
Q501
COMP
WAVE SHAPER
1.2msec
IC503 (10) REC/PB
IC601 SERVO
AVDD
AVREF
DRUM D/A
DRUM FG
DRUM PG
SW POS ADJ
DRUM FWD/RVS
DRUM STEP
SYSTEM SYNC
COMPOSITE SYNC
JOG VD
CAP FG (SERVO)
CAP FG (HMS COUNTER)
DRUM ON
1/2 RF SWP
RF SWP
ATF ERROR
CAP PWM
CAP ERR
RP PB MODE
SEL 1
SEL 2
CAP FWD/RVS
CAP ON
IC602
5V REG
IC501 (1/3)
R503
C501
R504,505
1/2 VDD
IC501 (1/3)
W605
DC/DC CONV
CN2
DRUM ERROR
PWM MOD
TRIANGLE WAVE
MOTOR UNREG
SWITCHING
DRUM VS
DRUM VS
2.4Vp-p
H
IC601 (58) REC/PB
COMP SYNC
JOG VD
RF SWP
VIDEO (1)
1/2 RF SWP
RF SWP
VIDEO (2)
5Vp-p
2V
IC601 (80) REC/PB
IC604
CAP PWM LPF
Q573
W605
LIMITER
DRUM VS
CAP VS
Q571 – 572
CORRELATION LIMIT DETECTOR
DC/DC CONV
CAP ERROR
PWM MOD
TRIANGLE OSCILLATOR
MOTOR UNREG
SWITCHING
CAP VS
CAP NFB
PB RF (SYSCON) (Q661)
SP/LP VIDEO (1) (IC205(14))
SP/LP
GAIN CONT
IC505
ATF SERVO
PB RF (Q164)
Q541 PB RF BUFFER
LPF
PRE AMP
GCA
BALANCED MODULATOR
3.1H BPF
1H BPF
PEAK DET
PEAK DET
SAMPLING HOLD
SAMPLING HOLD
SCHMITT
VREF
AMP
ATF ERROR
CH1/CH2
TS A
RP PB MODE
VIDEO (2)
REC ATF
Q542,543 REC ATF LPF
REC ATF
1/58 1/50 1/56 1/40
OSC
X501 5.94755MHz
3Vp-p
5.94MHz
IC505 (14) REC/PB
4Vp-p
5.94MHz
IC505 (16) REC/PB
CN204
REC C CHECK

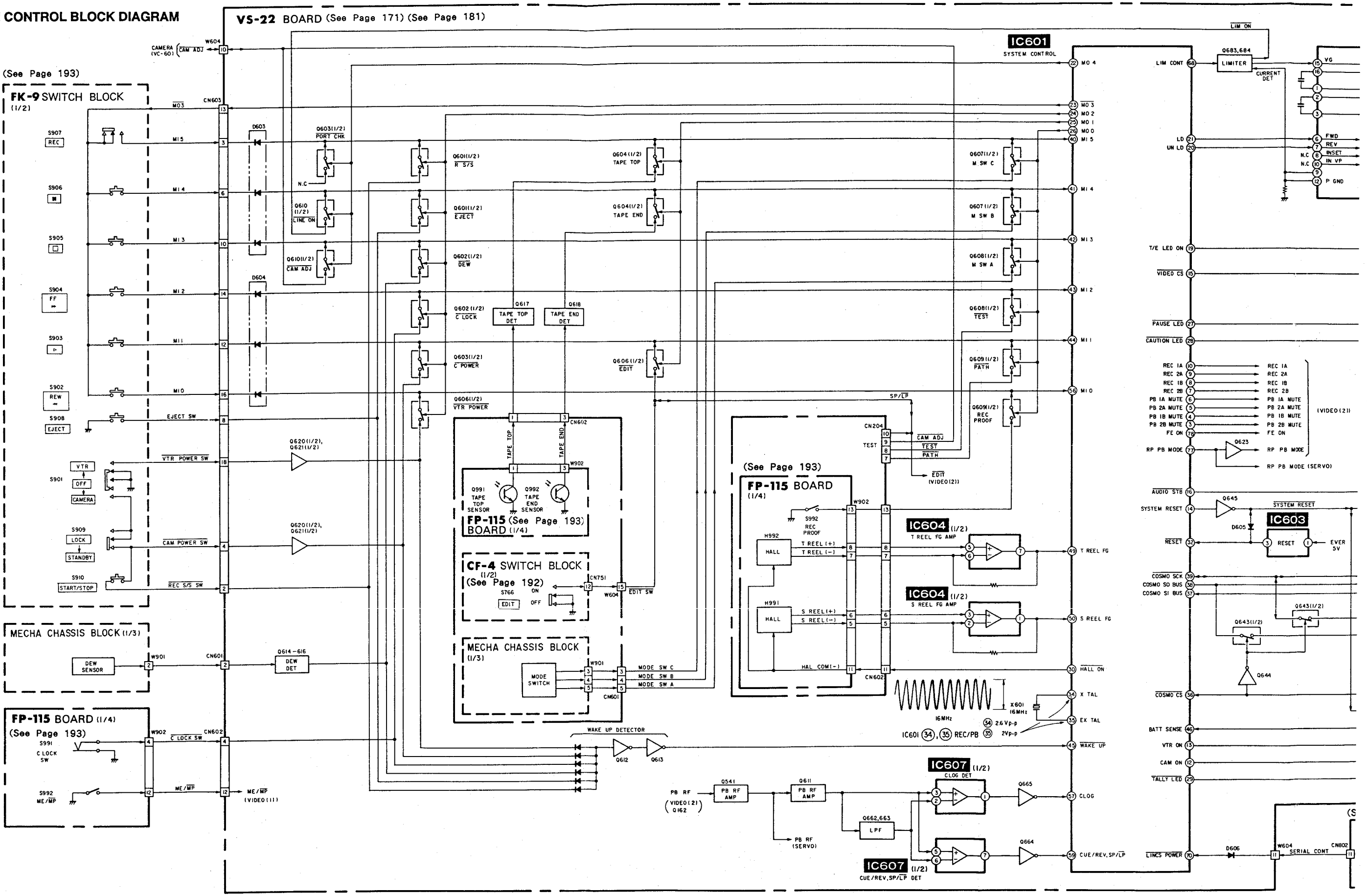

CN203
REC AFM RF
PB RF
AUDIO (AU-51)
IDEO (1)
RVO
CN204
RF CH1
RF CH2
RF SWP
RF SWP
TEST

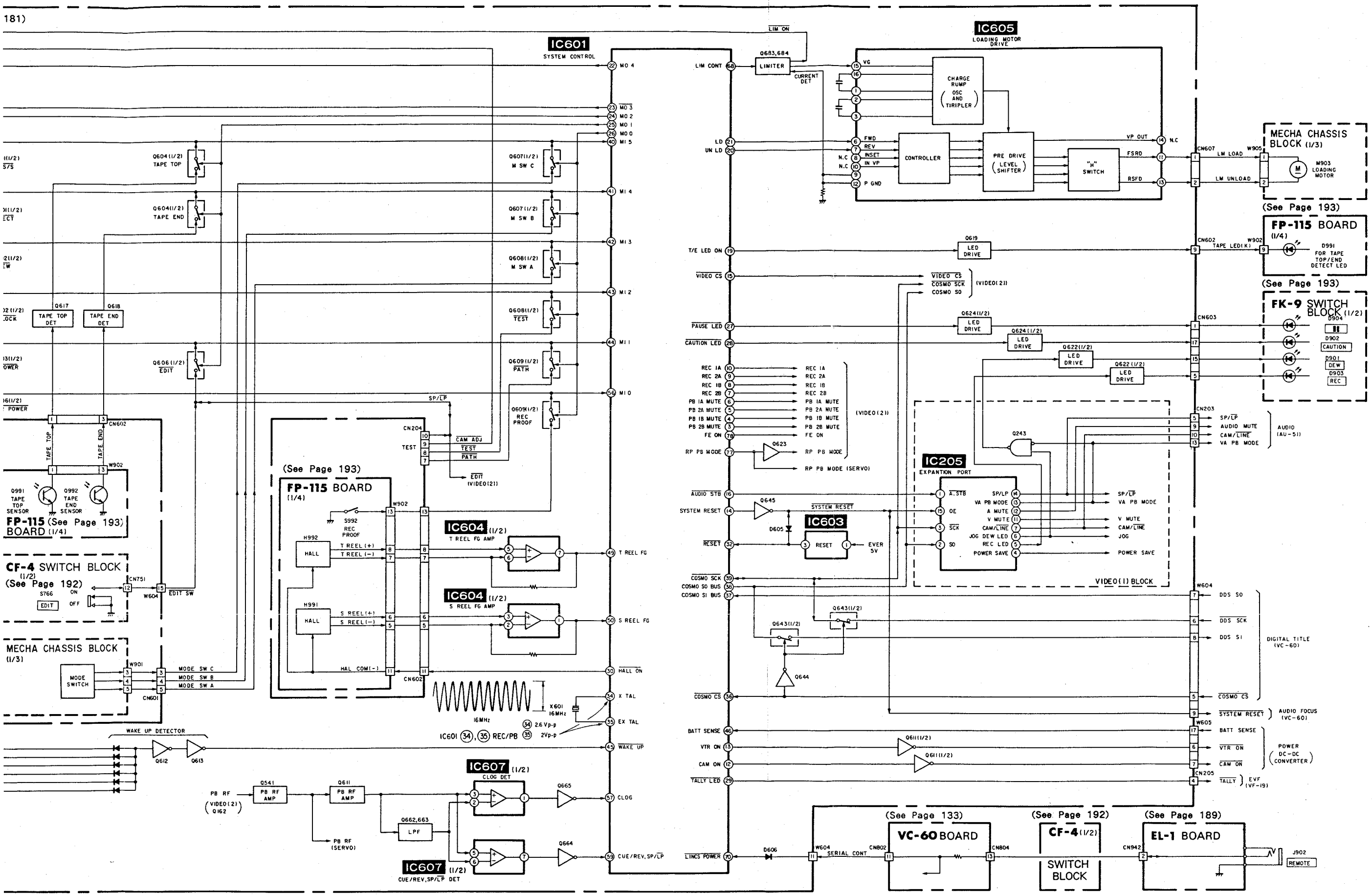
3-9. SERVO BLOCK DIAGRAM


VS-22 BOARD
(See Page 181)
IC503 ②
0.05Vp-p
IC503 ③
5Vp-p
3.6msec
IC503 ②③ REC/PB
MECHA CHASSIS BLOCK
DRUM
PG
FG
CN501
LPF
IC503 (1/2)
PRE
COMP
LEVEL CHIPT
DC BIAS
D FG
D PG
5Vp-p
22msec (3/4)
IC503 ⑦ REC/PB
RV602
SW POS ADJ
CAPSTAN FG
+B
W502
C FG (+)
C FG (−)
RV502
CFG OFF SET ADJ
IC503 (1/2)
Q501
COMP
WAVE SHAPER
5Vp-p
1.2msec
IC503 ⑩ REC/PB
IC601
SERVO
AVDD
AVRBP
DRUM D/A
DRUM FG
DRUM PG
SW POS ADJ
DRUM FWD/RVS
DRUM STEP
SYSTEM SYNC
COMPOSITE SYNC
JOG VD
CAP FG (SERVO)
CAP FG (HMS COUNTER)
DRUM ON
1/2 RF SWP
RF SWP
ATF ERROR
CAP PWM
CAP ERH
RP PB MODE
SEL 1
SEL 2
CAP FWD/RVS
CAP ON
IC602
5V REG
IC501 (1/3)
R503
C501
R504,505
1/2 VDD
IC501 (1/3)
W605
DC/DC CONV
CN2
DRUM ERROR
PWM MOD
TRAIANGLE WAVE
MOTOR UNREG
SWITCHING
DRUM VS
DRUM VS
2.4Vp-p
H
IC601 ㊳ REC/PB
EA IN
EB IN
EC IN
FWD/RVS
STEP
CLK
STEPPER
EX
N.C
COMP SYNC
JOG VD
RF SWP
VIDEO (1)
1/2 RF SWP
RF SWP
VIDEO (2)
5Vp-p
2V
IC601 (80) REC/PB
IC604
CAP PWM LPF
Q573
LIMITER
DRUM VS
CAP VS
Q571-572
CORRELATION LIMIT DETECTOR
DC/DC CONV
CAP ERROR
PWM MOD
TRIANGLE OSCILLATOR
MOTOR UNREG
SWITCHING
CAP VS
CAP NFB
PB RF (SYSCON) (Q661)
SP/LP VIDEO (1) (IC205 ⑭)
SP/LP
IC505
ATF SERVO
GAIN CONT
VIDEO (2)
PB RF (Q164)
Q541
PB RF BUFFER
LPF
PRE AMP
GCA
BALANCED MODULATOR
31H BPF
1H BPF
PEAK DET
PEAK DET
SAMPLING HOLD
SAMPLING HOLD
SCHMITT
VREP
AMP
ATF ERROR
CH1/CH2
TS A
RP PB MODE
REC ATF
Q542,543
REC ATF LPF
REC ATF
1/58 1/50 1/36 1/40
OSC
X501 5.94755MHz
3Vp-p
5.94MHz
IC505 ⑭ REC/PB
4Vp-p
5.94MHz
IC505 ⑯ REC/PB
CN204
REC C CHECK


IC601
SERVO
IC602
5V REG
IC501 (1/3)
IC501 (1/3)
DC/DC CONV
DRUM ERROR
PWM MOD
TRIANGLE WAVE
MOTOR UNREG SWITCHING
DRUM VS
W605
CN2
AVDD
AVRBP
DRUM D/A
R504,505
1/2 VDD
R503
C501
DRUM FG
DRUM PG
SW POS ADJ
RV602 SW POS ADJ
D FG
D PG
0.05Vp-p
5Vp-p
REC/PB
2.4Vp-p
IC601 (58) REC/PB
DRUM FWD/RVS
DRUM STEP
SYSTEM SYNC
COMPOSITE SYNC
JOG VD
COMP SYNC
JOG VD
RF SWP
VIDEO (1)
WAVE SHAPER
CAP FG (SERVO)
CAP FG (HMS COUNTER)
1.2msec
IC503 (10) REC/PB
DRUM ON
1/2 RF SWP
RF SWP
VIDEO (2)
IC601 (80) REC/PB
2V
SCHMITT
AMP
VREF
ATF ERROR
RP PB MODE
SEL 1
SEL 2
CAP PWM
CAP ERH
CAP FWD/RVS
CAP ON
IC604
CAP PWM LPF
Q573
LIMITER
DRUM VS
CAP VS
Q571-572
CORRELATION LIMIT DETECTOR
DC/DC CONV
CAP ERROR
PWM MOD
TRIANGLE OSCILLATOR
MOTOR UNREG
SWITCHING
CAP VS
CAP NFB
Q574-576,578
DRUM ERROR
DRUM ON
CURRENT LIMIT DETECTOR
Q577
CURRENT LIMITER
IC502
DRUM MOTOR DRIVE CONTROL
EA IN
EB IN
EC IN
FWD/RVS
STEP
CLX
STEPPER
STARTER
EX 1
EX2
N.C
CAOT
CBOT
CCOT
FGOT
RSOT
MC IN
IC501 (1/3)
DRUM MOTOR DRIVE
VS
CONT A
CONT B
CONT C
3 TO 6 CONVERTER
SWITCHING
RESET IN
MC OUT
POWER SAVE
RV501 DRUM MM ADJ
CR
REMOTE
IB SET
COM
DRUM ON
A OUT
B OUT
C OUT
EA OUT
EB OUT
EC OUT
DRUM V
DRUM U
DRUM W
DRUM COM
DRUM I COM
CN501
CN204 TEST
CN203
RF SWP
AUDIO (AU-51)
CN202
CAMERA REC (VC-60)
MECHA CHASSIS BLOCK
M901 DRUM MOTOR
IC504
CAPSTAN MOTOR DRIVE
CAP VS
CAP FWD/RVS
CAP ON
CAP CW/CCW
STBY
POWER OFF
120° LOGIC
HE POWER
UHE
VHE
WHE
CAP U
CAP V
CAP W
C HALL Vcc
C HALL GND
H1
H2
H3
W502
MECHA CHASSIS BLOCK
M902 CAPSTAN MOTOR
HALL DEVICE

3-10. SYSYTEM CONTROL BLOCK DIAGRAM


VS-22 BOARD (See Page 171) (See Page 181)
(See Page 193)
FK-9 SWITCH BLOCK (1/2)
S907 REC
S906
S905
S904 FF
S903
S902 REW
S908 EJECT
S901 VTR OFF CAMERA
S909 LOCK STANDBY
S910 START/STOP
MO3
MI5
MI4
MI3
MI2
MI1
MI0
EJECT SW
VTR POWER SW
CAM POWER SW
REC S/S SW
CAMERA (VC-60) CAM ADJ
W604
CN603
D603
D604
Q603(1/2) PORT CHK
Q610 (1/2) LINE ON
Q610(1/2) CAM ADJ
N.C
Q601(1/2) R S/S
Q601(1/2) EJECT
Q602(1/2) DEW
Q602(1/2) C LOCK
Q603(1/2) C POWER
Q606(1/2) VTR POWER
Q620(1/2), Q621(1/2)
Q604(1/2) TAPE TOP
Q604(1/2) TAPE END
Q617 TAPE TOP DET
Q618 TAPE END DET
Q606(1/2) EDIT
Q607(1/2) M SW C
Q607(1/2) M SW B
Q608(1/2) M SW A
Q608(1/2) TEST
Q609(1/2) PATH
Q609(1/2) REC PROOF
SP/LP
CN602
TAPE TOP
TAPE END
W902
Q991 TAPE TOP SENSOR
Q992 TAPE END SENSOR
FP-115 (See Page 193) BOARD (1/4)
CF-4 SWITCH BLOCK (1/2) (See Page 192)
S766 EDIT ON OFF
CN751
W604
EDIT SW
MECHA CHASSIS BLOCK (1/3)
MODE SWITCH
W901
CN601
MODE SW C
MODE SW B
MODE SW A
MECHA CHASSIS BLOCK (1/3)
DEW SENSOR
Q614-616 DEW DET
FP-115 BOARD (1/4) (See Page 193)
S991 C LOCK SW
S992 ME/MP
C LOCK SW
ME/MP
ME/MP (VIDEO(1))
WAKE UP DETECTOR
Q612
Q613
CN204
TEST
CAM ADJ
TEST
PATH
EDIT (VIDEO(2))
(See Page 193)
FP-115 BOARD (1/4)
S992 REC PROOF
H992 HALL
T REEL (+)
T REEL (−)
H991 HALL
S REEL (+)
S REEL (−)
HAL COM(−)
IC604 (1/2) T REEL FG AMP
IC604 (1/2) S REEL FG AMP
X601 16MHz
16MHz
34 2.6Vp-p
2Vp-p
IC601 34, 35 REC/PB 35
PB RF (VIDEO(2) Q162)
Q541 PB RF AMP
Q611 PB RF AMP
PB RF (SERVO)
Q662,663 LPF
IC607 (1/2) CLOG DET
Q665
Q664
IC607 (1/2) CUE/REV,SP/LP DET
IC601 SYSTEM CONTROL
MO 4
MO 3
MO 2
MO 1
MO 0
MI 5
MI 4
MI 3
MI 2
MI 1
MI 0
T REEL FG
S REEL FG
HALL ON
X TAL
EX TAL
WAKE UP
CLOG
CUE/REV, SP/LP
LIM CONT
LD
UN LD
T/E LED ON
VIDEO CS
PAUSE LED
CAUTION LED
REC 1A
REC 2A
REC 1B
REC 2B
PB 1A MUTE
PB 2A MUTE
PB 1B MUTE
PB 2B MUTE
FE ON
RP PB MODE
Q623
RP PB MODE (SERVO)
(VIDEO(2))
AUDIO STB
SYSTEM RESET
Q645
SYSTEM RESET
D605
IC603 RESET
EVER 5V
RESET
COSMO SCK
COSMO SO BUS
COSMO SI BUS
Q643(1/2)
Q643(1/2)
Q644
COSMO CS
BATT SENSE
VTR ON
CAM ON
TALLY LED
LINCS POWER
D606
W604 SERIAL CONT
CN802
LIM ON
Q683,684 LIMITER
CURRENT DET
VG
FWD
REV
INSET
IN VP
N.C
P GND


IC601
SYSTEM CONTROL
IC605
LOADING MOTOR DRIVE
LIMITER
CHARGE RUMP (OSC AND TIRIPLER)
CONTROLLER
PRE DRIVE (LEVEL SHIFTER)
"H" SWITCH
MECHA CHASSIS BLOCK (1/3)
M903 LOADING MOTOR
(See Page 193)
FP-115 BOARD (1/4)
D991 FOR TAPE TOP/END DETECT LED
FK-9 SWITCH BLOCK (1/2)
D904
D902 CAUTION
D901 DEW
D903 REC
IC205
EXPANTION PORT
IC603
RESET
VIDEO(1) BLOCK
AUDIO (AU-51)
DIGITAL TITLE (VC-60)
AUDIO FOCUS (VC-60)
POWER (DC-DC CONVERTER)
EVF (VF-19)
IC604 (1/2)
T REEL FG AMP
IC604 (1/2)
S REEL FG AMP
IC607 (1/2)
CLOG DET
IC607 (1/2)
CUE/REV,SP/LP DET
X601 16MHz
16MHz
IC601 (34),(35) REC/PB
(34) 2.6 Vp-p
(35) 2Vp-p
WAKE UP DETECTOR
PB RF (VIDEO(2) Q162)
Q541 PB RF AMP
Q611 PB RF AMP
Q662,663 LPF
PB RF (SERVO)
(See Page 193)
FP-115 BOARD (1/4)
H992 HALL
H991 HALL
S992 REC PROOF
CF-4 SWITCH BLOCK (1/2)
(See Page 192)
S766 EDIT ON OFF
MECHA CHASSIS BLOCK (1/3)
MODE SWITCH
Q617 TAPE TOP DET
Q618 TAPE END DET
Q991 TAPE TOP SENSOR
Q992 TAPE END SENSOR
FP-115 (See Page 193) BOARD (1/4)
(See Page 133)
VC-60 BOARD
(See Page 192)
CF-4 (1/2) SWITCH BLOCK
(See Page 189)
EL-1 BOARD
J902 REMOTE
SERIAL CONT
LINCS POWER
D606
181)

3-11. SYSTEM CONTROL SECTION FUNCTION DESCRIPTION

The system control section consists of following four microcomputers:

- Mode/mechanism control microcomputer CXP80116
- DDS microcomputer µPD7503GF
- EVR microcomputer MC68HC05N4FU
- AF microcomputer MC68HC05C4FU

3-11-1. Mode/Mechanism Control Microcomputer CXP80116 (IC601 on VS-22 Board)

1. Function description

1) Power ON/OFF control
2) Key matrix read
   (Playback, Record, Fast-forward, Rewind, Pause, Stop, VIDEO/CAMERA Power Supply, Cassette Eject, START/STOP)
3) Servo
4) Loading motor control
5) Error detection
   - Battery end/pre-end
   - Tape end
   - No cassette
   - Erasure prevention
   - DEW (condensation)
   - PAUSE release
   - CLOG (head clog)
   - L.MOTOR EMERGENCY
   - Drum rotation
   - Drum phase
   - Real rotation
   - Capstan rotation
   - Drum/capstan start
6) H.M.S. counter
7) JOG VD insertion
8) Execution of various modes

2. Abbreviated specifications

- 8-bit high-speed, highly integrated single chip microcomputer
- A/D converter, 8-bit, 8-channel
- Serial interface
- Time/counter
- Time base timer
- Vector interrupts
- High precision timing pattern generation function (high-speed output)
- PWM/DA gate pulse output, 12-bit, 2-channel
- High precision measurement function (FRC) for servo signals
- Power on reset function
- Sleep and stop functions
- External memory expansion mode, microprocessor mode
- ROM: 16 Kbytes
- RAM: 352 Kbytes
- Speed: 500 ns
- Process: C MOS
- Operating voltage: 4.5 to 5.5V
- Package: 80-pin flat package

3. Terminal function (CXP80116)

<table>
<tr><th>Pin No.</th><th>Signal Name</th><th>I/O</th><th colspan="2">Function</th><th>Connection</th></tr>
<tr><td>1</td><td>SEL 2</td><td>O</td><td colspan="2" rowspan="2">ATF REF PILOT signal frequency (f1 to f4) selecting signal. (*1)<table><tr><td>ATF REF PILOT</td><td>f1</td><td>f2</td><td>f3</td><td>f4</td></tr><tr><td>SEL 1</td><td>H</td><td>L</td><td>H</td><td>L</td></tr><tr><td>SEL 2</td><td>H</td><td>H</td><td>L</td><td>L</td></tr></table></td><td rowspan="2">To ATF servo IC
(IC505: CXA1204Q)</td></tr>
<tr><td>2</td><td>SEL 1</td><td>O</td></tr>
<tr><td>3</td><td>PB 2B MUTE</td><td>O</td><td colspan="2" rowspan="4">Crosstalk from the other heads prevention control signal during playback.
Mute by "H". (*1)</td><td rowspan="4">To REC/PB amp
(IC101, IC102)</td></tr>
<tr><td>4</td><td>PB 1B MUTE</td><td>O</td></tr>
<tr><td>5</td><td>PB 2A MUTE</td><td>O</td></tr>
<tr><td>6</td><td>PB 1A MUTE</td><td>O</td></tr>
<tr><td>7</td><td>$\overline{\text{REC 2B}}$</td><td>O</td><td colspan="2" rowspan="4">Drum head (1A, 2A, 1B, 2B) switching recording timing signal.
REC by "H". (*1).</td><td rowspan="4">To REC/PB amp
(IC101, IC102)</td></tr>
<tr><td>8</td><td>$\overline{\text{REC 1B}}$</td><td>O</td></tr>
<tr><td>9</td><td>$\overline{\text{REC 2A}}$</td><td>O</td></tr>
<tr><td>10</td><td>$\overline{\text{REC 1A}}$</td><td>O</td></tr>
<tr><td>11</td><td>SYSTEM SYNC</td><td>O</td><td colspan="2">INT-V signal for drum servo. Used as a clock during step start with drum driver IC CXA1206. (*1)</td><td>Drum servo IC
(Pin ⑭ of IC502)</td></tr>
<tr><td>12</td><td>CAM ON</td><td>O</td><td colspan="2">Camera DC/DC converter on/off signal. "H" when power of camera is turned on.</td><td>To DC/DC converter</td></tr>
<tr><td>13</td><td>VTR ON</td><td>O</td><td colspan="2">VTR DC/DC converter on/off signal. "H" when power of camera or video is turned on.</td><td>To DC/DC converter</td></tr>
<tr><td>14</td><td>SYSTEM RESET</td><td>O</td><td colspan="2">Reset AF microcomputer during Power ON, and input to video/audio extension port (IC205) to mute audio signal during Power ON.</td><td>Pin ⑨ of IC612 and Pin (60) of IC613 on VC-60 board, Pin ⑮ of IC205 on VS-22 board.</td></tr>
<tr><td>15</td><td>$\overline{\text{VIDEO CS}}$</td><td>O</td><td colspan="2">Selecting signal to video IC, CXA1200Q and CXA1201Q of internal bus signal. Select by "L".</td><td>Pin ㉑ of IC201
Pin ⑰ of IC202</td></tr>
<tr><td>16</td><td>$\overline{\text{AUDIO STB}}$</td><td>O</td><td colspan="2">Data strobe signal to video/audio extension port (IC205) of internal bus communication. Latch by _|‾.</td><td>Pin ① of IC205</td></tr>
<tr><td>17</td><td>CAP FWD/$\overline{\text{RVS}}$</td><td>O</td><td colspan="2">Capstan rotation direction control signal.
FWD by "H", RVS by "L". (*1)</td><td>Pin ⑳ of IC504</td></tr>
<tr><td>18</td><td>CAP ON</td><td>O</td><td colspan="2">Capstan driver ON control signal. Capstan ON by "H". (*1)</td><td>Pin ⑬ of IC504</td></tr>
<tr><td>19</td><td>T/E LED ON</td><td>O</td><td colspan="2">TAPE top/end LED driving signal.</td><td>Q619 Ⓑ</td></tr>
<tr><td>20</td><td>UNLOAD</td><td>O</td><td colspan="2" rowspan="2">Loading motor control signal<table><tr><td>Conditions / Signals</td><td>OFF</td><td>LOADING</td><td>UN-LOADING</td><td>BRAKE</td></tr><tr><td>LOAD</td><td>L</td><td>H</td><td>L</td><td>H</td></tr><tr><td>UNLOAD</td><td>L</td><td>L</td><td>H</td><td>H</td></tr></table></td><td>Pin ⑦ of IC605</td></tr>
<tr><td>21</td><td>LOAD</td><td>O</td><td>Pin ⑥ of IC605</td></tr>
<tr><td>22</td><td>MO4</td><td>O</td><td colspan="2" rowspan="5">Only Matrix output $\overline{\text{MO3}}$ is "L" active.
Only $\overline{\text{MO3}}$ is "L" pulse output, the other ports are "H" pulse output.</td><td rowspan="5"></td></tr>
<tr><td>23</td><td>$\overline{\text{MO3}}$</td><td>O</td></tr>
<tr><td>24</td><td>MO2</td><td>O</td></tr>
<tr><td>25</td><td>MO1</td><td>O</td></tr>
<tr><td>26</td><td>MO0</td><td>O</td></tr>
<tr><td>27</td><td>$\overline{\text{PAUSE LED}}$</td><td>O</td><td>PAUSE LED control signal. "L" when PAUSE LED is lit.</td><td rowspan="3">Middle withstand voltage (12V), Large current (12 mV) port.</td><td>Pin ② of Pause LED driver Q624</td></tr>
<tr><td>28</td><td>$\overline{\text{CAUTION LED}}$</td><td>O</td><td>CAUTION LED control signal. "L" when CAUTION LED is lit.</td><td>Pin ⑤ of Caution LED driver Q624</td></tr>
<tr><td>29</td><td>$\overline{\text{TALLY LED}}$</td><td>O</td><td>External TALLY LED and EVF internal TALLY drive. "L" when TALLY LED is lit.</td><td>TALLY LED</td></tr>
</table>

Pin No.	
30	$\overline{\text{HA}}$
31	MP
32	$\overline{\text{RES}}$
33	V_{SS}
34	XT
35	EX
36	$\overline{\text{COS}}$
37	COS
38	COS
39	$\overline{\text{COS}}$
40	MI 5
41	MI 4
42	MI 3
43	MI 2
44	MI 1
45	$\overline{\text{WA}}$
46	BAT
47	N.C.
48	SW
49	T RE
50	S RE
51	ATF
52	AV_{SS}
53	AV_{R}
54	AV_{D}
55	DRU
56	MI 0
57	CLO
58	COM
59	CUE/ SP/$\overline{\text{L}}$
60	DRU
61	DRU
62	CAP

p microcomputer

ction (high-speed

:l
for servo signals

essor mode

3. Terminal function (CXP80116)

<table>
<tr><th>Pin No.</th><th>Signal Name</th><th>I/O</th><th colspan="2">Function</th><th>Connection</th></tr>
<tr><td>1</td><td>SEL 2</td><td>O</td><td colspan="2" rowspan="2">ATF REF PILOT signal frequency (f1 to f4) selecting signal. (*1)<table><tr><td>ATF REF PILOT</td><td>f_1</td><td>f_2</td><td>f_3</td><td>f_4</td></tr><tr><td>SEL 1</td><td>H</td><td>L</td><td>H</td><td>L</td></tr><tr><td>SEL 2</td><td>H</td><td>H</td><td>L</td><td>L</td></tr></table></td><td rowspan="2">To ATF servo IC
(IC505: CXA1204Q)</td></tr>
<tr><td>2</td><td>SEL 1</td><td>O</td></tr>
<tr><td>3</td><td>PB 2B MUTE</td><td>O</td><td colspan="2" rowspan="4">Crosstalk from the other heads prevention control signal during playback.
Mute by "H". (*1)</td><td rowspan="4">To REC/PB amp
(IC101, IC102)</td></tr>
<tr><td>4</td><td>PB 1B MUTE</td><td>O</td></tr>
<tr><td>5</td><td>PB 2A MUTE</td><td>O</td></tr>
<tr><td>6</td><td>PB 1A MUTE</td><td>O</td></tr>
<tr><td>7</td><td>$\overline{\text{REC 2B}}$</td><td>O</td><td colspan="2" rowspan="4">Drum head (1A, 2A, 1B, 2B) switching recording timing signal.
REC by "H". (*1).</td><td rowspan="4">To REC/PB amp
(IC101, IC102)</td></tr>
<tr><td>8</td><td>$\overline{\text{REC 1B}}$</td><td>O</td></tr>
<tr><td>9</td><td>$\overline{\text{REC 2A}}$</td><td>O</td></tr>
<tr><td>10</td><td>$\overline{\text{REC 1A}}$</td><td>O</td></tr>
<tr><td>11</td><td>SYSTEM SYNC</td><td>O</td><td colspan="2">INT-V signal for drum servo. Used as a clock during step start with drum driver IC CXA1206. (*1)</td><td>Drum servo IC
(Pin ⑭ of IC502)</td></tr>
<tr><td>12</td><td>CAM ON</td><td>O</td><td colspan="2">Camera DC/DC converter on/off signal. "H" when power of camera is turned on.</td><td>To DC/DC converter</td></tr>
<tr><td>13</td><td>VTR ON</td><td>O</td><td colspan="2">VTR DC/DC converter on/off signal. "H" when power of camera or video is turned on.</td><td>To DC/DC converter</td></tr>
<tr><td>14</td><td>SYSTEM RESET</td><td>O</td><td colspan="2">Reset AF microcomputer during Power ON, and input to video/audio extension port (IC205) to mute audio signal during Power ON.</td><td>Pin ⑨ of IC612 and Pin (60) of IC613 on VC-60 board, Pin ⑮ of IC205 on VS-22 board.</td></tr>
<tr><td>15</td><td>$\overline{\text{VIDEO CS}}$</td><td>O</td><td colspan="2">Selecting signal to video IC, CXA1200Q and CXA1201Q of internal bus signal. Select by "L".</td><td>Pin ㉑ of IC201
Pin ⑰ of IC202</td></tr>
<tr><td>16</td><td>$\overline{\text{AUDIO STB}}$</td><td>O</td><td colspan="2">Data strobe signal to video/audio extension port (IC205) of internal bus communication. Latch by _┌.</td><td>Pin ① of IC205</td></tr>
<tr><td>17</td><td>CAP FWD/$\overline{\text{RVS}}$</td><td>O</td><td colspan="2">Capstan rotation direction control signal.
FWD by "H", RVS by "L". (*1)</td><td>Pin ⑳ of IC504</td></tr>
<tr><td>18</td><td>CAP ON</td><td>O</td><td colspan="2">Capstan driver ON control signal. Capstan ON by "H". (*1)</td><td>Pin ⑬ of IC504</td></tr>
<tr><td>19</td><td>T/E LED ON</td><td>O</td><td colspan="2">TAPE top/end LED driving signal.</td><td>Q619Ⓑ</td></tr>
<tr><td>20</td><td>UNLOAD</td><td>O</td><td colspan="2" rowspan="2">Loading motor control signal<table><tr><td>Conditions / Signals</td><td>OFF</td><td>LOADING</td><td>UN-LOADING</td><td>BRAKE</td></tr><tr><td>LOAD</td><td>L</td><td>H</td><td>L</td><td>H</td></tr><tr><td>UNLOAD</td><td>L</td><td>L</td><td>H</td><td>H</td></tr></table></td><td>Pin ⑦ of IC605</td></tr>
<tr><td>21</td><td>LOAD</td><td>O</td><td>Pin ⑥ of IC605</td></tr>
<tr><td>22</td><td>MO4</td><td>O</td><td colspan="2" rowspan="5">Only Matrix output $\overline{\text{MO3}}$ is "L" active.
Only $\overline{\text{MO3}}$ is "L" pulse output, the other ports are "H" pulse output.</td><td rowspan="5"></td></tr>
<tr><td>23</td><td>$\overline{\text{MO3}}$</td><td>O</td></tr>
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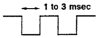
<tr><td>25</td><td>MO1</td><td>O</td></tr>
<tr><td>26</td><td>MO0</td><td>O</td></tr>
<tr><td>27</td><td>$\overline{\text{PAUSE LED}}$</td><td>O</td><td>PAUSE LED control signal. "L" when PAUSE LED is lit.</td><td rowspan="3">Middle withstand voltage (12V), Large current (12 mV) port.</td><td>Pin ② of Pause LED driver Q624</td></tr>
<tr><td>28</td><td>$\overline{\text{CAUTION LED}}$</td><td>O</td><td>CAUTION LED control signal. "L" when CAUTION LED is lit.</td><td>Pin ⑤ of Caution LED driver Q624</td></tr>
<tr><td>29</td><td>$\overline{\text{TALLY LED}}$</td><td>O</td><td>External TALLY LED and EVF internal TALLY drive. "L" when TALLY LED is lit.</td><td>TALLY LED</td></tr>
</table>

Pin No.	Signal Name	I/O	Function	Connection
30	$\overline{\text{HALL ON}}$	O	Reel FG hole element. Drive, middle withstand voltage and large current port. 	Reel sensor
31	MP	I	Microcomputer processor mode selecting pin → unselecting.	GND
32	$\overline{\text{RESET}}$	I	Reset input. "L" active.	Pin ③ of reset IC IC603
33	V_{SS}		GND	GND
34	XTAL	O	Crystal connecting pin for system clock oscillation. Oscillation at: 16 MHz.	Oscillation crystal X601
35	EXTAL	I		
36	$\overline{\text{COSMO CS}}$	I	Selecting signal from DDS microcomputer of internal bus communication to mode/mechanism control. Selected by "L".	DDS microcomputer Pin ⑭ of IC561 on VC-60 board
37	COSMO SI BUS	I	Serial data input pin.	
38	COSMO SO BUS	O	Serial data output pin.	
39	$\overline{\text{COSMO SCK}}$	I/O	Input/output pin for serial clock.	
40	MI 5	I	Matrix input.	
41	MI 4			
42	MI 3			
43	MI 2			
44	MI 1			
45	$\overline{\text{WAKE UP}}$	I	STBY release input. Released by "L".	
46	BATT SENSE	I	Battery end/pre-end voltage input. A/D input pin.	Inside BATT END ADJ DC-DC converter
47	N.C.			
48	SW POS ADJ	I	Switching position adjustment input (Test mode). A/D input pin	SW POS ADJ RV602
49	T REEL FG	I	T-reel/S-reel FG input. A/D input pin.	Pin ⑦ of IC604
50	S REEL FG	I		Pin ① of IC604
51	ATF ERROR	I	ATF error (ATF LOCK error)input. A/D input pin.	Pin ⑫ of ATF IC IC505
52	AV_{SS}		A/D converter GND pin.	GND
53	AV_{REF}	I	A/D converter reference voltage input pin	Pin ① of regulator IC IC602 for EVER 5V
54	AV_{DD}		A/D converter positive power supply pin	
55	DRUM PG	I	DRUM PG input. FRC (High precision timer)capture input pin.	Pin ⑦ of SEnse amp IC503
56	MI 0	I	Matrix input	
57	CLOG	I	Clog detection signal input. Clog by "H".	Q665 Ⓒ
58	COMPOSITE SYNC	I	Composite sync signal input (Incorporated V SYNC separator)	Pin ⑭ of VIDEO IC IC201
59	CUE/REV SP/$\overline{\text{LP}}$	I	SP/LP discrimination signal input when CUE/REV, etc. "H" when SP mode, "L" when LP mode.	Q664 Ⓒ
60	DRUM PG	I	Not used.	Pin ⑦ of Sense amp IC503
61	DRUM FG	I	DRUM FG input pin. FRC capture input pin.	Pin ③ of Sense amp IC503
62	CAP FG	I	CAPSTAN FG input pin. FRC capture input pin.	Pin ⑩ of Sense amp IC503

Pin No.	Signal Name	I/O	Function	Connection
63	DRUM STEP	O	Step mode control signal of drum motor driver. "H" when drum start.	Pin ⑫ of IC502
64	DRUM $\overline{\text{FWD}}$/RVS	O	DRUM rotation direction control signal. RVS by "H", FWD by "L".	Pin ⑬ of IC502
65	CAP ERH	O	H level output pin to set capstan error to maximum level when capstan start and stop.	Pin ⑫ of IC604
66	DRUM D/A	O	DA gate pulse output pin to output DRUM error. Exclusive servo output pin (DA mode).	
67	CAP PWM	O	PWM output pin servo exclusive output pin to output cap error (PWM mode)	
68	LIM CONT	O	Loading motor current limiter control signal so as to prevent fingers from being nipped. Limiter ON by "H".	
69	CAP FG	I	External event input pin to Cap FG input pin exclusive counter for Tape counter drive	Pin ⑩ of Sense amp IC503
70	$\overline{\text{LINCS POWER}}$	I	Input for release microcomputer standby to turn on the unit from external with remote commander.	Remote jack Pin ② of J902 on EL-1 board
71	$\overline{\text{NMI}}$	I	Non-maskable interrupt request pin. NMI is not used.	EVER 5V
72	V_{DD}		Positive power supply pin	EVER 5V
73	V_{SS}		GND pin.	GND
74	V_{PP}		N.C.	EVER 5V
75	DRUM ON	O	DRUM driver ON control signal.	Pin ㉘ of IC501
76	JOG VD	O	Insert to VIDEO signal when variable speed playback. Simulated VD output pin. (*1)	Pin ⑤ of IC201
77	RP PB MODE	O	Switching signals for REC/PB amplifier and REC/PB mode of ATF IC. (*1)	ATF IC Pin ㉕ of IC505 REC/PB amp (IC101, IC102)
78	$\overline{\text{FE ON}}$	O	Flying erase oscillation ON/OFF signal. Oscillating by "L". (*1)	Flying erase oscillation circuit
79	$\overline{\text{1/2 RF SWP}}$	O	1/2 RF SWP output pin. (*1)	REC/PB amp
80	RF SWP	O	RF SWP output pin. (*1)	REC/PB amp Video system

*1: High precision real time pattern output and high precision real time pulse output terminal

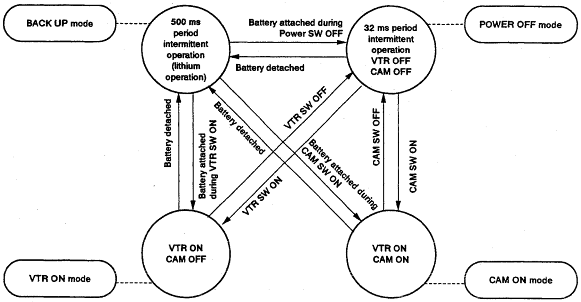
3-11-2. DDS microcomputer μPD7503GF (IC561 on VC-60 Board)

1. Function description

1) Internal data communication control
2) Date/time measurement
3) LCD indication
4) Reading of key matrix
(White balance, electronic shutter, edit search +/-, auto-lock, focus mode, counter reset, zero memory, title, store, color/mode, backlight compensation, date/forward, time/set, fader)

2. Operation modes

- As shown in the chart below, the operation mode is shifted according to the position of the power switch (camera/off/video) and whether or not there is a main battery.


BACK UP mode
500 ms period intermittent operation (lithium operation)
Battery attached during Power SW OFF
Battery detached
32 ms period intermittent operation VTR OFF CAM OFF
POWER OFF mode
Battery detached
Battery attached during VTR SW ON
Battery detached
VTR SW OFF
Battery attached during CAM SW ON
VTR SW ON
CAM SW OFF
CAM SW ON
VTR ON CAM OFF
VTR ON CAM ON
VTR ON mode
CAM ON mode

- **The main DDS microcomputer functions in each mode is as follows.**

Mode	Main Battery	Power Switch	Microcomputer power supply	Clock Mode	LCD	EVF	Main Functions
BACK UP	No	Camera/ off/ video	LI 3V (Lithium battery)	500 ms period intermittent oscillation	–	–	• Backup of title and tape counter data • Clock count operation
POWER OFF	Yes	Off	EVER 5V (Main battery)	32 ms period intermittent oscillation	○	○	• Counter/date/time indication to LCD • Date/time set function (Zero memory and counter reset are invalid.)
VTR ON	Yes	Video	EVER 5V + SS 5V (Main battery)	Continuous oscillation	○	○	• Serial communication with EVR and mode/mechanism control microcomputer • Indication to LCD • Acceptance of zero memory and counter reset keys
CAM ON	Yes	Camera	EVER 5V + SS 5V (Main battery)	Continuous oscillation	○	–	• VTR ON functions and all camera features • Indication control for white balance, focus, titles, electronics shutter, etc. • Indication to EVF and LCD

3. Terminal function and input/output level (µPD7503GF)

Pin No.	Signal Name	I/O	Functions and I/O Level
1	———	–	
2	$\overline{\text{CMO 2}}$	O	Key matrix output signal. "L" pulse of 18 ms (VTR mode) or 1V period (camera mode).
3	$\overline{\text{CMO 1}}$	O	
4	$\overline{\text{CMO 0}}$	O	
5	DDS SI	I	Serial communication and data input. V period "L" pulse train.
6	DDS SO	O	Serial communication and data output. V period "H" pulse train.
7	$\overline{\text{DDS SCK}}$	I/O	Serial communication and serial clock input/output. V period "L" pulse train.
8	$\overline{\text{TEST}}$	I	Test mode input. Normally "H".
9	$\overline{\text{LI PE}}$	I	Lithium battery pre-end detection. Normally "H". "L" when lithium battery voltage drops.
10	VTR PWR	I	SS 5V power detection. "H" when power on.
11	CG BUSY	I	Busy signal input from character generator. V period "H" pulse train.
12	CMO 4	O	Key matrix output signal. "H" pulse of 18 ms (VTR mode) or 1V period (camera mode).
13	$\overline{\text{EVR CS}}$	O	Chip select signal to EVR microcomputer (IC361 on VC-60 board). "L" pulse of 1V period.
14	$\overline{\text{COSMO CS}}$	O	Chip select signal to servo/system control microcomputer (IC601 on VS-22 board). "L" pulse of 1V period.
15	CG STB	O	Strobe signal for character generator. 1V period "H" pulse train.
16	SRAM CS	O	Strobe signal to timing generator (VC-60 board, DT-74 board). Camera mode: "H" pulse of 1V period. VTR mode: "L"
17	TITLE CS	O	Chip select signal to static RAM (IC801 on TI-15 board). VTR mode: "L" Camera mode: Normally "L". "H" during title operation.
18	TITLE CS	O	Chip select signal to title controller (IC802 on LI-15 board). VTR mode: "L" Camera mode: "H" pulse of 1V period.
19	LCD OFF	O	LCD indication ON/OFF control output. Normally "L" (0V). "H" (3V) when backed up by lithium battery.
20	X2	O	Crystal oscillation circuit for clock. Oscillation frequency is 32.768 kHz
21	X1	I	
23	VLC 3	I	LCD power supply 3 input pin. Normally 0V. 3V when backed up.
24	VLC 2	I	LCD power supply 2 input pin. Normally 1.7V. 3V when backed up.
25	VLC 1	I	LCD power supply 1 input pin. Normally 3.3V. 3V when backed up.
26	VDD	I	Power supply input pin.
27	COM 3	O	LCD remote control pin driving output 3. 4 values of 0, 1.7, 3.3, 5V outputs.
28	COM 2	O	LCD remote control pin driving output 2.
29	COM 1	O	LCD remote control pin driving output 1.
30	COM 0	O	LCD remote control pin driving output 0.

Pin No.	Signal Name	I/O	Functions and I/O Level
31		I	
32 | 41	———	I	Not used
42 | 54	S12 | S0	O	LCD segment pin driving output, 12 to 0. 4 values of 0, 1.7, 3.3, 5V outputs.
55	INT 1	I	Interrupt input by camera VD. VTR mode: "H". Camera mode: "H" pulse of 1V period.
56	RESET	I	Normally "L".
57	CL 1	I	System clock oscillation pin. • When video power ON or camera power ON: Continuous oscillation (oscillation frequency approx. 330 kHz). • When power OFF: 32 ms period intermittent oscillation (oscillation frequency approx. 330 kHz) • When backed up by lithium battery: 32 ms intermittent oscillation (oscillation frequency approx. 70 kHz) or 500 ms period intermittent oscillation
59	CL 2	I	
58	VDD	O	Power supply input pin.
60	CMI 3	I	Key matrix input signal. Normally "H". When key input, "L" pulse of 18 ms (VTR mode) or 1V period (camera mode).
61	CMI 2	I	
62	CMI 1	I	
63	CMI 0	I	
64	$\overline{\text{COM 3}}$	I	Key matrix input signal. Normally "H". When key input, "L" pulse of 18 ms (VTR mode) or 1V period (camera mode).

3-11-3. EVR microcomputer MC68HC05N4FU (IC361 on VC-60 Board)

1. Function description

1) EVR control
2) Auto white balance control
3) Electronic shutter

2. Pin function and input/output level (MC68HC05N4FU)

Pin No.	Signal Name	I/O	Functions and I/O Level
1	——		——
2	$\overline{\text{SSW}}$	O	"H" only during communicating with serial switching D/A converter. "H" pulse of V period.
3	$\overline{\text{SCLK}}$	O	Serial clock output. V period "L" pulse train.
4	SI	I	Serial data input. V period "H" pulse train.
5	SO	O	Serial data output. V period "L" pulse train.
6	$\overline{\text{EVR CS}}$	I	Communication request from DDS. "L" pulse of V period.
7	L IN	I	LANC input. L: 0, H: 1. V period "H" pulse train.
8	L OUT	O	LANC output. L: 0, H: 1. V period "H" pulse train.
9	$\overline{\text{CAM ADJ}}$	I	NORMAL/ADJUST selection. Normally "H". "L" during adjustment.
10	FADER PWM	O	Fader control signal for CAMERA/AUDIO signal. Normally "L".
11	SSW	O	Serial signal switching. "L" pulse of V period.
12, 13	LD	O	Data load instruction to EVR (IC252, IC302). "H" pulse of V period.
14	$\overline{\text{BACK LIGHT}}$	O	"L" during backlight compensation ON.
15	MACRO	I	Control from AF microcomputer, Indoor (IN): H, outdoor (OUT): L according to brightness.
16	——		
17	VDD		Connected to EVER 5V.
18			GND
19	——	–	
20	PAL/$\overline{\text{NTSC}}$	I	Broadcast system selection. L: NTSC, H: PAL.
21	GND		——
22	GND		——
23	GND		——
24, 25	GND		——
26	GND	–	——
27	GND	–	——
28	CAM 5V	I	Camera power on monitoring. L: CAM OFF, H: CAM ON.
29	AW IN	I	AWB A/D timer stop. Pattern drive interrupt. Normally ??V period pulse.
30	AW ADJ	O	AWB preset data fetch. Normally "L". "H" during auto white balance adjustment.
31	——	–	NC
32	——	–	——
33	——	–	——
34	S3SW	O	AWB measurement signal selection. "H" pulse of 3V period.
35	S2SW	O	AWB measurement signal selection. "H" pulse of 3V period.
36	DISCHG	O	Capacitor reset pulse for timer measurement lamp voltage generation. "H" pulse of V period.
37	——	–	——
38	S1SW	O	AWB measurement signal selection. "H" pulse of 3V period.
39	——	–	——
40	OSC2	O	Built-in inverter output for oscillation. Oscillation frequency: 4 MHz.
41	OSC1	I	Built-in inverter input for oscillation.
42	VDD		Connected to EVER 5V.
43	——		——
44	$\overline{\text{RESET}}$		Normally "H". "L" when reset.
45	$\overline{\text{IRQ}}$		Connected to $\overline{\text{EVR CS}}$ signal. "L" pulse of V period.
46	——	–	Normally "H". "L" when reset.
47	——	–	Normally "H". "L" when reset.
48	$\overline{\text{A/D EN}}$	O	1-bit A/D converter operation ON/OFF output for titler. Normally "H". "L" for 7V period when title store button (S762 on CF-4 board) pressed.

3-11-4. AF microcomputer MC68HC05C4FU (IC613 on VC-60 Board)

1. Function description

1) AF control
2) Power focus
3) Zoom motor drive

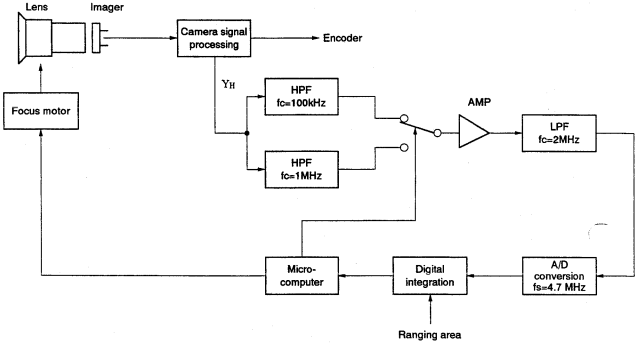
2. Auto focus system of this unit (A-AF: Image processing system)

The high frequency components of video signal (actually luminance signal) are microcomputer processed by TTL without using external sensors to control the focus).

3. Outline of operation

The frequency components from 100k to 2 MHz and from 1M to 2 MHz are extracted from the luminance (Y) signal, and these are digitally integrated for each field. This integration value is called the evaluation value. This evaluation value becomes the information for auto focusing, and focus ring is controlled by finding the peaks in the evaluation values based on the concepts that:

Picture is in focus → edges of image become clearer → high frequency components of image increase → evaluation value increases



4. Pin function and input/output level (MC68HC05C4FU)

Pin No.	Signal Name	I/O	Functions and I/O Level
1	SS OUT	O	EVR data read timing output (PD5 SS input). V period "L" pulse train.
2	IN/OUT	O	Indoors/outdoors determination according to aperture value. "H" for indoors and "L" for outdoors.
3			
4			
5			
6	LOW CONTRAST	O	Signal to DDS microcomputer (IC561 on VC-60 board). "L" when subject has low contrast.
7	———	–	
8			Not used.
9	———	–	
10	———	–	
11	ZOOM T	O	Normally "H". "L" when zoom motor is rotated in telephoto direction by remote commander.
12	ZOOM W	O	Normally "H". "L" when zoom motor is rotated in wide angle direction by remote commander.
13	Focus N	O	Normally "L". "H" when focus motor is rotated in close range direction.
14	———	–	
15	Focus F	O	Normally "L". "H" when focus motor is rotated in far range direction.
16	F SPD ϕ	O	0 bit (LSB) of focus motor speed control signal.
17	———	–	
18	F SPD1	O	1 bit of focus motor speed control signal.
19	F SPD2	O	2 bits of focus motor speed control signal.
20	———	–	
21	F SPD3	O	3 bits (MSB) of focus motor speed control signal.
22	———	–	
23	Vss	–	Connected to GND.
24	Vss	–	Connected to GND.
25	———	–	
26	Focus NEAR	I	"L" when focus ring is at close range edge.
27	———	–	
28	———	–	
29	———	–	
30	FOCUS FAR	I	"L" when focus ring is at far range edge.
31	AF SSW	O	Timing output for bus selection. "H" pulse of V period.
32	———	–	
33	DA STB	O	D/A converter for AF. For data latch. V period "H" pulse train.
34	PAL/NTSC	I	PAL/NTSC selection.
35	———	–	
36	J STB	O	External display jig. For data latch. "L" pulse of V period.
37	XCS	O	Active "L" for communication request to IC612 CXD-1204. "L" pulse of V period.
38	TEST	I	Connected to VDD.
39	———	–	
40	MODE	I	Connected to VDD.
41	MISO	I/O	SPI MASTER: in...SLAVE: out...V period "H" pulse train.
42	MOSI	I/O	SPI MASTER: out...SLAVE: in...V period "L" pulse train.
43	SCK	I/O	SPI SERIAL CLOCK. V period "L" pulse train.
44	———	–	
45	SS	I	V period "L" pulse train.
46	———	–	

Pin No.	Signal Name	I/O	Functions and I/O Level
47	———	–	
48	EVR CS	I	EVR data communication request from DDS microcomputer. "L" pulse of V period.
49	———	–	
50	———	–	
51	Focus FG	I	Interrupt generation by Focus motor FG . "H" when auto focus OFF. "L" pulse of period according to Focus motor rotation speed when auto focus ON.
52	CLK OUT	O	Waveform shaped output of Pin ㊹ clock (1.79 MHz)
53	———	–	
54	CLK IN	I	External clock input. 14.3 MHz clock input to Pin ㉘ of IC612 is divided by 8.
55	VDD		CAM 5V
56	———	–	
57	———	–	
58	———	–	
59	———	–	
60	SYS RST	I	Normally "H". "L" when resetting.
61	AREA	I	Interrupt generation by rom CXD-1204 (IC612). V period pulse
62	VPP		CAM 5V
63	WND W/N	I	Auto focus ranging area switching. Connected to VDD by 100 kΩ (Fixed to WIDE).
64	———	–	

3-12. INTERFACE

3-12-1. System Control — Video Audio Block Interface

Signal Name	I/O	Pin No.	VTR Mode													CAMERA Mode					
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB· PAUSE	FRAME	SLOW	REC	REC PAUSE	STAND BY	REC	EDIT SEARCH		REC REVIEW	
						CUE	REVIEW		CUE	REVIEW								FWD	RVS	FWD	RVS
SP/$\overline{\text{LP}}$	O	Pin ⑭ of IC205 on VS-22 board	*1	H	H	*2	*2	*2	*2	*2	*1	*1	*1	H	H	H	H	*2	*2	H	H
VA PB MODE	O	Pin ⑬ of IC205 on VS-22 board	L	L	L	H	H	H	H	H	H	H	H	L	L	L	L	H	H	H	H
AUDIO MUTE	O	Pin ⑫ of IC205 on VS-22 board	L	L	L	H	H	L^{*3}	H	H	H	H	H	L	L	L	L	H	H	L	H
VIDEO MUTE	O	Pin ⑪ of IC205 on VS-22 board	L	L	L	L	L	L^{*3}	L	L	L	L	L	L	L	L	L	L	L	L	L
CAM/$\overline{\text{LINE}}$	O	Pin ⑦ of IC205 on VS-22 board	L	L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H	H	H
JOG/DEW LED	O	Pin ⑥ of IC205 on VS-22 board	L^{*4}	L	L	H	H	L	H	H	H	H	H	L	L	L	L	L	H	L	H
$\overline{\text{REC LED}}$	O	Pin ⑤ of IC205 on VS-22 board	H	H	H	H	H	H	H	H	H	H	H	L	L	H	H	H	H	H	H
POWER SAVE	O	Pin ④ of IC205 on VS-22 board	H	H	H	L	L	L	L	L	L	L	L	L	H	H	L	L	L	L	L
JOG VD	O	Pin (76) of IC601 on VS-22 board	L	L	L	*5	*5	H	*5	*5	*5	*5	*5	L	L	L	L	L	*5	L	*5
RP PB MODE	O	Pin (77) of IC601 on VS-22 board	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
$\overline{\text{FE ON}}$	O	Pin (78) of IC601 on VS-22 board	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
$\overline{\text{1/2 RF SWP}}$	O	Pin (79) of IC601 on VS-22 board	H/L	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
RF SWP	O	Pin (80) of IC601 on VS-22 board	H/L	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
PB 2B MUTE	O	Pin ③ of IC601 on VS-22 board	H/L	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	L	L	L	L	*8	*8	*8	*8
PB 1B MUTE	O	Pin ④ of IC601 on VS-22 board																			
PB 2A MUTE	O	Pin ⑤ of IC601 on VS-22 board																			
PB 1A MUTE	O	Pin ⑥ of IC601 on VS-22 board																			

Signal Name	I/O	Pin No.	VTR Mode													CAMERA Mode					
			STOP	FF	REW	FR SEARCH		PB	PICTURE SERACH		PB· PAUSE	FRAME	SLOW	REC	REC PAUSE	STAND BY	REC	EDIT SEARCH		REC REVIEW	
						CUE	REVIEW		CUE	REVIEW								FWD	RVS	FWD	RVS
REC2B	O	Pin ⑦ of IC601 on VS-22 board	H/L	H	H	H	H	H	H	H	H	H	H	*9	H	H	*9	H	H	H	H
REC1B	O	Pin ⑧ of IC601 on VS-22 board																			
REC2A	O	Pin ⑨ of IC601 on VS-22 board																			
REC1A	O	Pin ⑩ of IC601 on VS-22 board																			
$\overline{\text{VIDEO CS}}$	O	Pin (99) of IC601 on VS-22 board	"L" pulse of V period.																		
$\overline{\text{AUDIO STB}}$	O	Pin ⑯ of IC601 on VS-22 board																			
COSMO SO	O	Pin ㊳ of IC601 on VS-22 board	V period pulse train.																		
$\overline{\text{COSMO SCK}}$	I/O	Pin ㊴ of IC601 on VS-22 board																			
CUE/REV SP/$\overline{\text{LP}}$	I	Pin (59) of IC601 on VS-22 board	H	*10	*10	*10	*10	L	*10	*10	*10			H	H/L	H/L	H	L	*10	L	*10
CLOG	I	Pin (57) of IC601 on VS-22 board	H	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	H			H	*11	*11	*11
COMPOSITE SYNC	I	Pin (58) of IC601 on VS-22 board	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12

*1. Outputs the determination result of last mode. SP mode "H", LP mode "L".

*2. Outputs the determination result of recording mode of playback tape.
SP mode "H", LP mode "L".

*3. "H" at non signal portion of tape

*4. "H" after mode shift completion during dew condensation generation.

*5. Simulated VD signal

*6. 15 Hz duty 50% pulse (synchronized to drum rotation)

*7. 30 Hz duty 50% pulse (synchronized to drum rotation)

*8. See timing chart 6.

*9. See timing chart 7.

*10. "H" at SP recording portion of tape, "L" at LP recording portion.

*11. "H" at no recording portion of tape, or drop-out portion. Head clog detection input.

*12. Composite sync signal input (polarity=+) separated from line input video signal, camera video signal, or playback video signal.

3-12-2. System Control — Servo Block Interface

Signal Name	I/O	Pin No.	VTR Mode													CAMERA Mode					
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB• PAUSE	FRAME	SLOW	REC	REC PAUSE	STAND BY	REC	EDIT SEARCH		REC REVIEW	
						CUE	REVIEW		CUE	REVIEW								FWD	RVS	FWD	RVS
T.REEL FG	I	Pin ㊾ of IC601 on VS-22 board	–	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	–	–	*1	*1	*1	*1	*1
S.REEL FG	I	Pin ㊿ of IC601 on VS-22 board	–	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	–	–	*1	*1	*1	*1	*1
ATF ERROR	I	Pin (51) of IC601 on VS-22 board	–	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
DRUM PG	I	Pins (55) and (60) of IC601 on VS-22 board	–	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3
DRUM FG	I	Pin (61) of IC601 on VS-22 board	–	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
CAP FG	I	Pins (62) and (69) of IC601 on VS-22 board	–	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5
CAP ON	O	Pin ⑱ of IC601 on VS-22 board	L	H	H	H	H	H	H	H	L	*15	*15	H	L	L	H	H	H	H	H
SEL 2	O	Pin ① of IC601 on VS-22 board	H	*6	*6	*7	*7	*8	*7	*7	L	*9	*10	*6	H	H	*6	*8	*11	*8	*11
SEL 1	O	Pin ② of IC601 on VS-22 board	L	*6	*6	*7	*7	*8	*7	*7	L	*9	*10	*6	L	L	*6	*8	*11	*8	*11
DRUM STEP *12	O	Pin (63) of IC601 on VS-22 board	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
DRUM $\overline{\text{FWD}}$/RVS *13	O	Pin (64) of IC601 on VS-22 board	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
CAP ERH *14	O	Pin (65) of IC601 on VS-22 board	–	HIZ	HIZ	HIZ	HIZ	HIZ	HIZ	HIZ	HIZ	*15	*15	HIZ	HIZ	HIZ	HIZ	HIZ	HIZ	HIZ	HIZ
DRUM D/A	O	Pin (66) of IC601 on VS-22 board	–	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16
CAP PWM	O	Pin (67) of IC601 on VS-22 board	–	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17
LIM CONT *18	O	Pin (68) of IC601 on VS-22 board	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
DRUM ON	O	Pin (75) of IC601 on VS-22 board	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H

*1. Pulse is input by reel rotation.

*2. ATF error voltage input.

*3. 1 PG pulse is input with 1 rotation of drum. Approx. 45 Hz.

*4. 6 FG pulses are input with 1 rotation of drum. Approx. 270 Hz.

*5. 360 FG pulses are input with 1 rotation of capstan. Approx. 820 Hz during REC/PB (SP).

*6. See timing chart 1.

*7. See timing chart 2.

*8. See timing chart 3.

*9. See timing chart 5.

*10. See timing chart 5.

*11. See timing chart 4.

*12. Normally "L", "H" only when drum motor starts.

*13. Normally "L". "H" temporarily only when loading/unloading (Drum inverts.)

*14. Normally HIZ (High impedance). "H" during start and stop of capstan

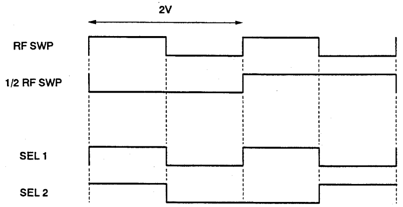
*15. "H" pulse when tape is advanced.

*16. "H" pulse/"L" pulse output as center level HIZ (2.5 Vdc).

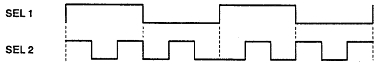
*17. 64 μsec sync PWM signal

3-12-3. Timing Chart

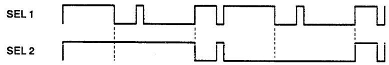
Timing chart 1
FF, REW, REC


2V
RF SWP
1/2 RF SWP
SEL 1
SEL 2

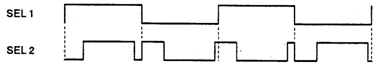
Timing chart 2
FR-SEARCH(CUE/REV)
PICTURE-SEARCH(CUE/REV)



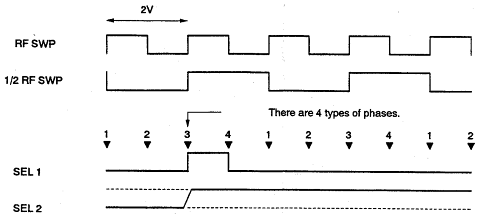
Timing chart 3
PB, EDIT-SEARCH(FWD)
REC-REVIEW(FWD)



Timing chart 4
EDIT-SEARCH(RVS)
REC-REVIEW(RVS)

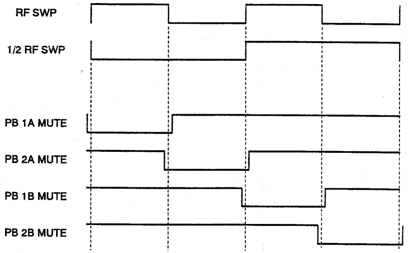


Timing chart 5
FRAME, SLOW

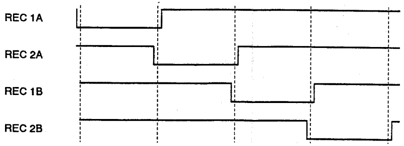

2V
RF SWP
1/2 RF SWP
There are 4 types of phases.
1
2
3
4
1
2
3
4
1
2
SEL 1
SEL 2

- 1 pulse generates every frame advancing is pressed in FRAME.
- 1 pulse generates 1 time in 10V in SLOW.

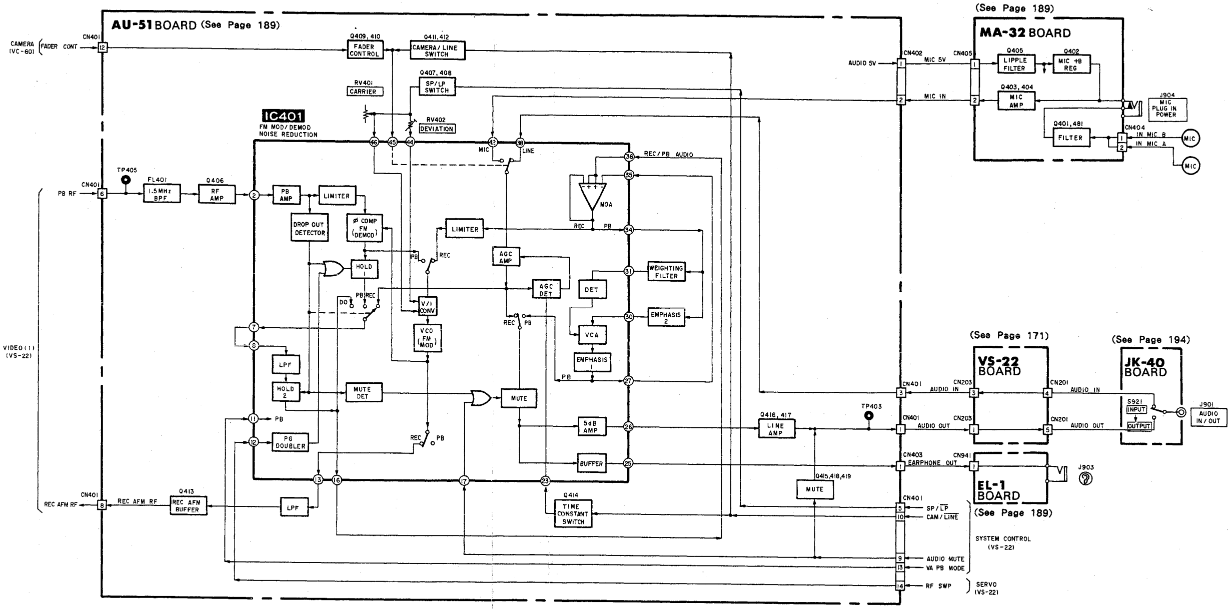
Timing chart 6


RF SWP
1/2 RF SWP
PB 1A MUTE
PB 2A MUTE
PB 1B MUTE
PB 2B MUTE

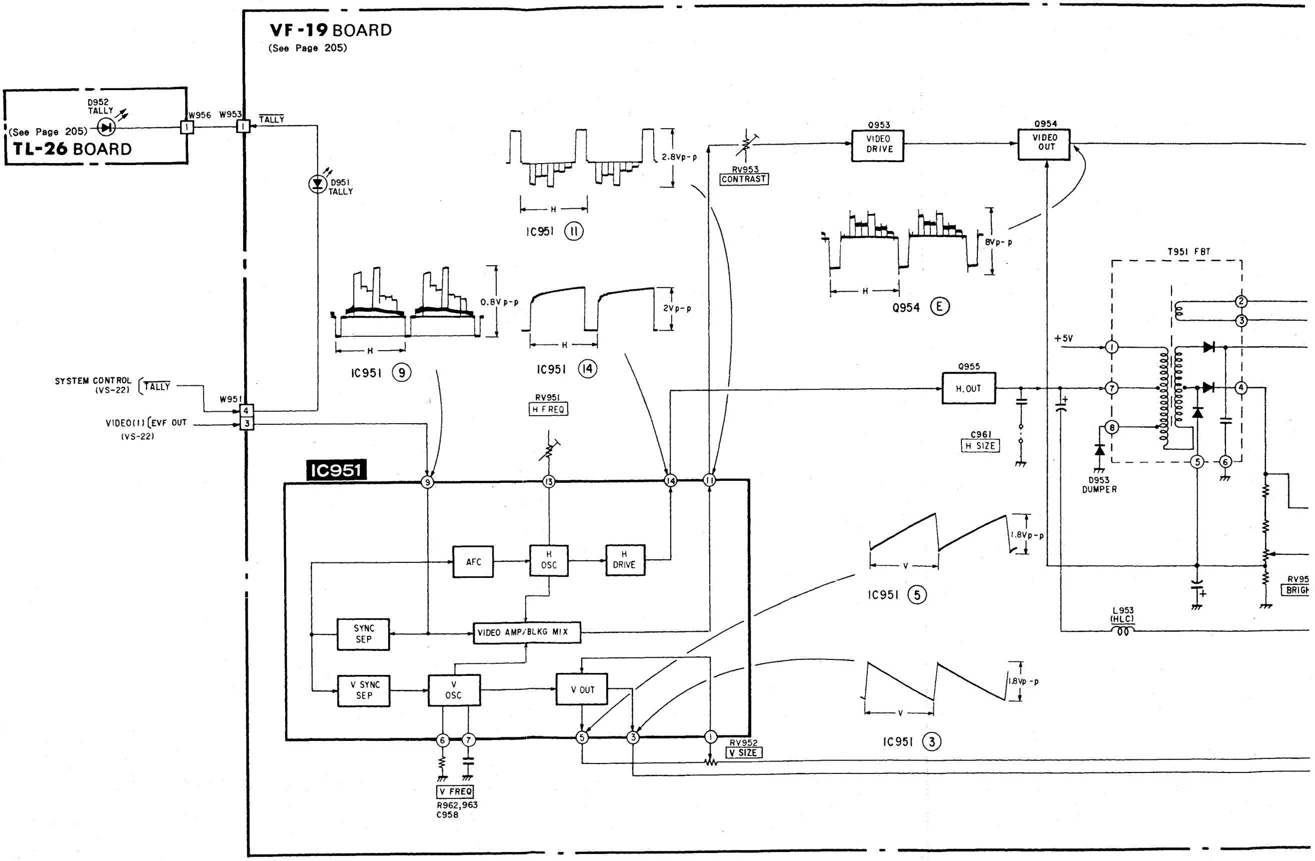
Timing chart 7

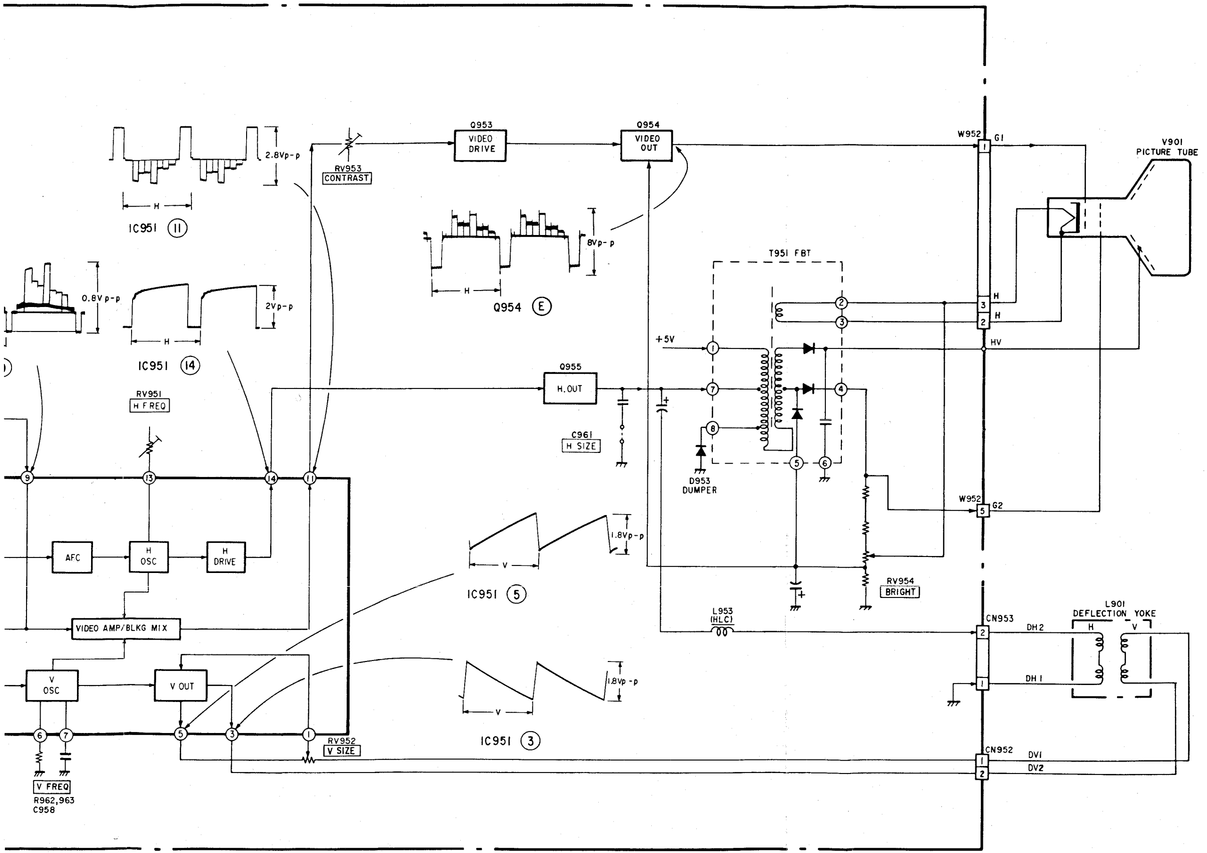

REC 1A
REC 2A
REC 1B
REC 2B

3-13. AUDIO BLOCK DIAGRAM

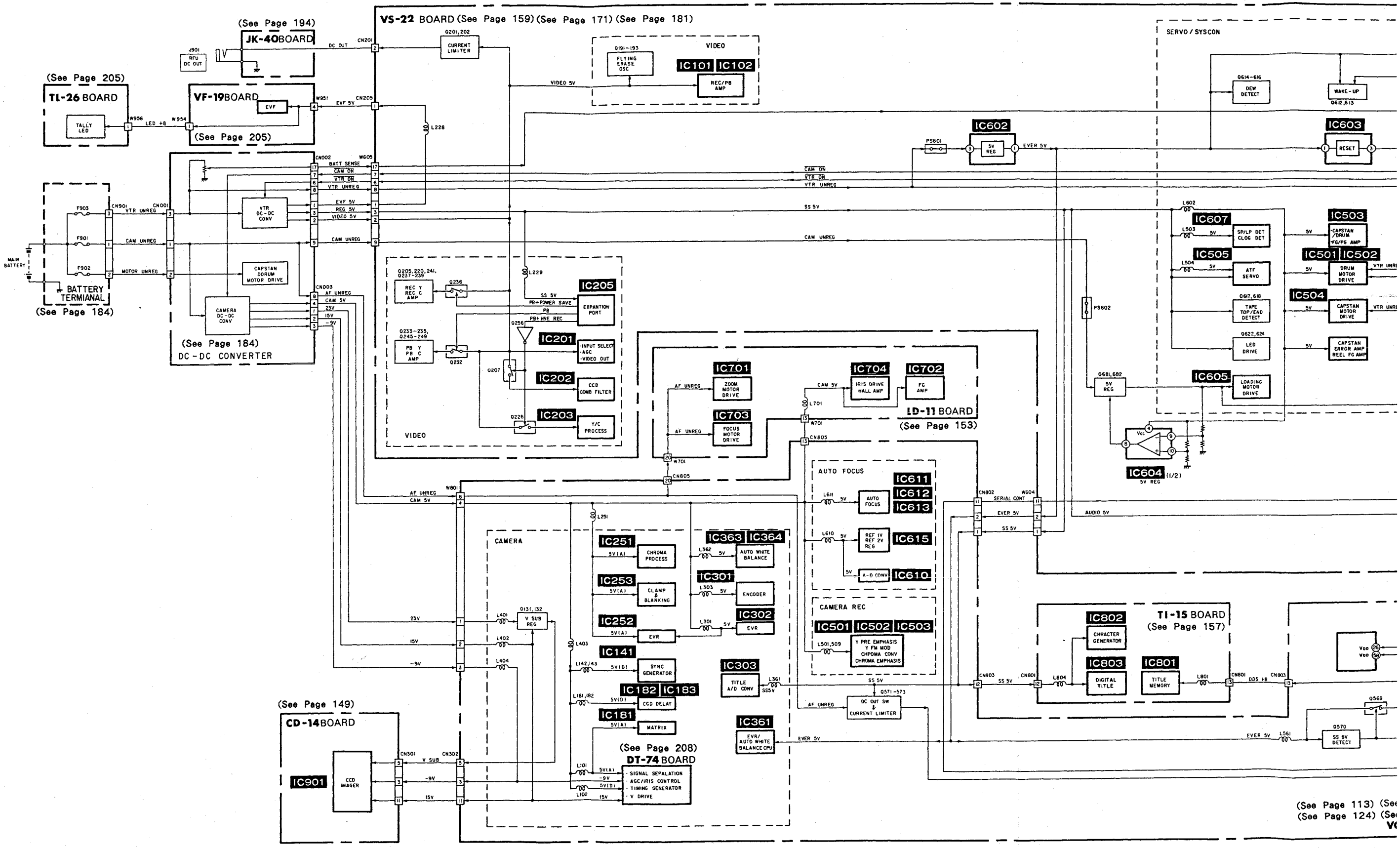

AU-51 BOARD (See Page 189)
CAMERA (VC-60)
FADER CONT
CN401
Q409, 410
FADER CONTROL
Q411, 412
CAMERA/LINE SWITCH
RV401
CARRIER
Q407, 408
SP/LP SWITCH
IC401
FM MOD/DEMOD NOISE REDUCTION
RV402
DEVIATION
MIC
LINE
REC/PB AUDIO
TP405
FL401
1.5MHz BPF
Q406
RF AMP
PB RF
PB AMP
LIMITER
DROP OUT DETECTOR
φ COMP FM (DEMOD)
LIMITER
HOLD 1
MOA
REC
PB
AGC AMP
AGC DET
DET
WEIGHTING FILTER
V/I CONV
VCO (FM MOD)
VCA
EMPHASIS 2
EMPHASIS 1
DO
PB REC
VIDEO (1) (VS-22)
LPF
HOLD 2
MUTE DET
MUTE
5dB AMP
BUFFER
PG DOUBLER
Q413
REC AFM BUFFER
REC AFM RF
LPF
Q414
TIME CONSTANT SWITCH
Q416, 417
LINE AMP
Q415, 418, 419
MUTE
TP403
AUDIO 5V
CN402
MIC 5V
MIC IN
(See Page 189)
MA-32 BOARD
CN405
Q405
LIPPLE FILTER
Q402
MIC +B REG
Q403, 404
MIC AMP
J904
MIC PLUG IN POWER
Q401, 481
FILTER
CN404
IN MIC B
IN MIC A
MIC
MIC
(See Page 171)
VS-22 BOARD
CN203
CN201
AUDIO IN
AUDIO OUT
(See Page 194)
JK-40 BOARD
S921
INPUT
OUTPUT
J901
AUDIO IN/OUT
CN403
CN941
EARPHONE OUT
EL-1 BOARD
(See Page 189)
J903
SP/LP
CAM/LINE
SYSTEM CONTROL (VS-22)
AUDIO MUTE
VA PB MODE
RF SWP
SERVO (VS-22)

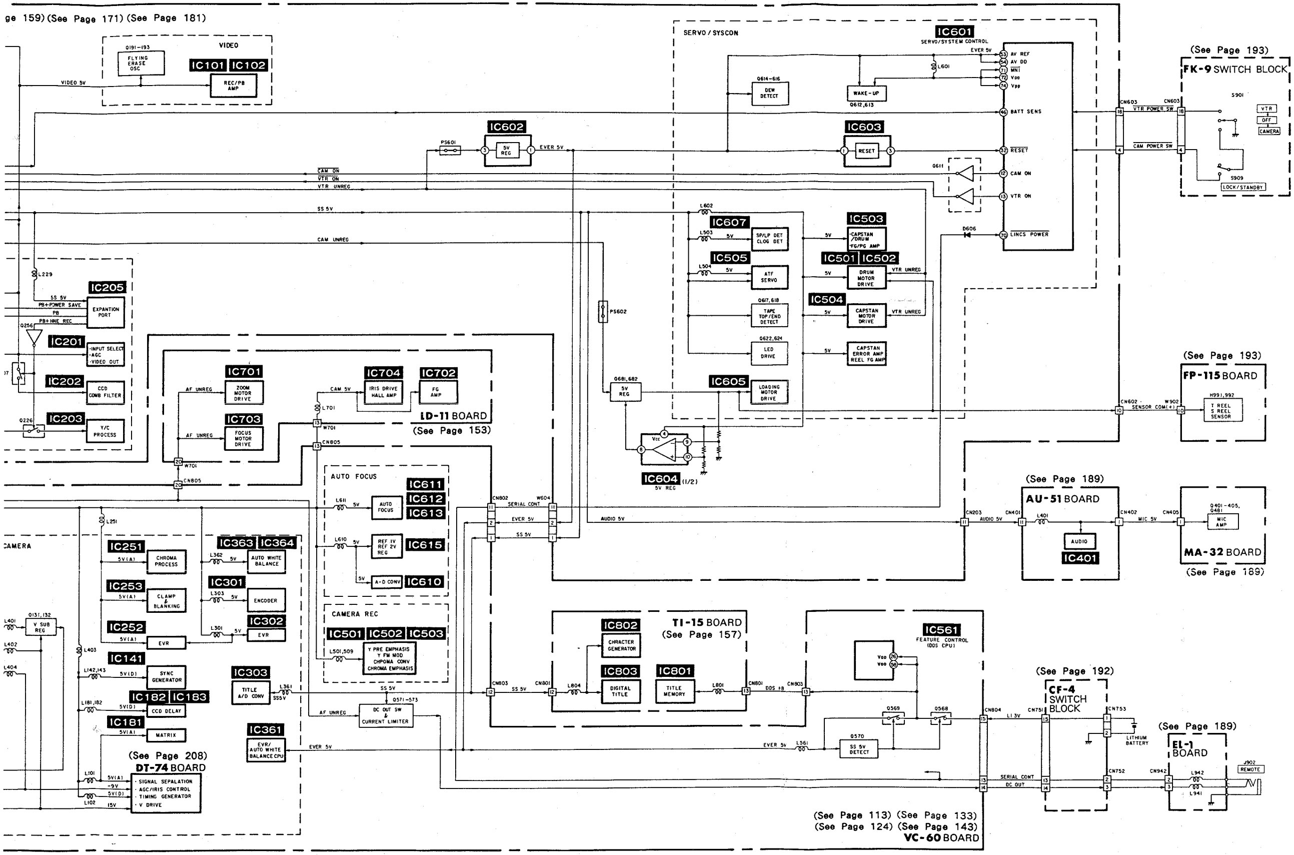
3-14. VIEW FINDER BLOCK DIAGRAM


VF-19 BOARD
(See Page 205)
TL-26 BOARD
(See Page 205)
D952
TALLY
W956
W953
TALLY
D951
TALLY
SYSTEM CONTROL (VS-22)
TALLY
W951
VIDEO(1) EVF OUT
(VS-22)
IC951
AFC
H OSC
H DRIVE
SYNC SEP
VIDEO AMP/BLKG MIX
V SYNC SEP
V OSC
V OUT
V FREQ
R962,963
C958
RV951
H FREQ
RV952
V SIZE
RV953
CONTRAST
2.8Vp-p
H
IC951 ⑪
0.8Vp-p
IC951 ⑨
2Vp-p
IC951 ⑭
Q953
VIDEO DRIVE
Q954
VIDEO OUT
8Vp-p
Q954 Ⓔ
T951 FBT
+5V
Q955
H.OUT
C961
H SIZE
D953
DUMPER
1.8Vp-p
V
IC951 ⑤
1.8Vp-p
IC951 ③
L953
(HLC)
RV95
BRIGH


2.8Vp-p
H
IC951 ⑪
0.8Vp-p
2Vp-p
H
IC951 ⑭
RV953
CONTRAST
Q953
VIDEO DRIVE
Q954
VIDEO OUT
8Vp-p
H
Q954 Ⓔ
W952
G1
V901
PICTURE TUBE
T951 FBT
H
H
HV
+5V
Q955
H.OUT
C961
H SIZE
D953
DUMPER
W952
G2
RV951
H FREQ
⑨
⑬
⑭
⑪
AFC
H OSC
H DRIVE
VIDEO AMP/BLKG MIX
1.8Vp-p
V
IC951 ⑤
RV954
BRIGHT
L953
(HLC)
CN953
DH2
DH1
L901
DEFLECTION YOKE
H
V
V OSC
V OUT
1.8Vp-p
V
IC951 ③
⑥
⑦
⑤
③
①
RV952
V SIZE
CN952
DV1
DV2
V FREQ
R962,963
C958

3-15. POWER BLOCK DIAGRAM

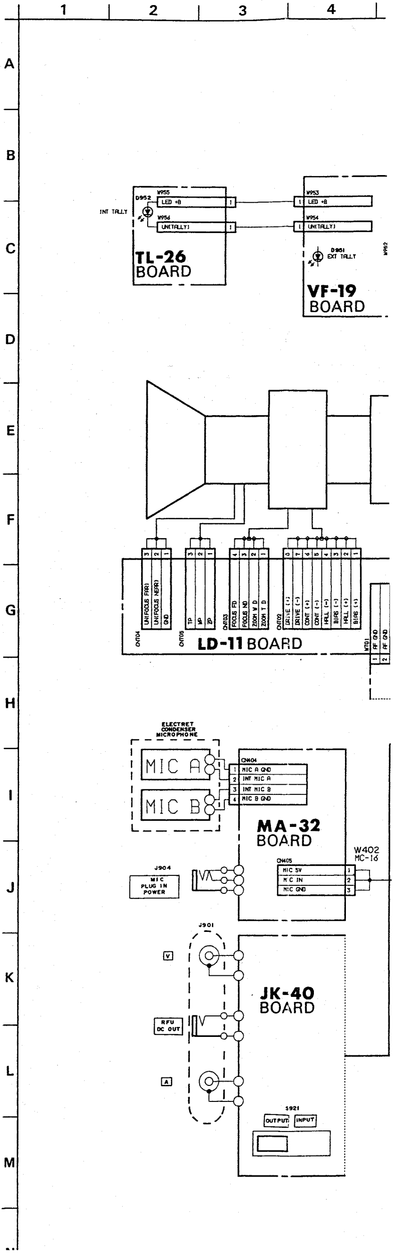

VS-22 BOARD (See Page 159) (See Page 171) (See Page 181)
(See Page 194)
JK-40BOARD
J901
RFU DC OUT
DC OUT
CN201
Q201,202
CURRENT LIMITER
VIDEO
Q191-193
FLYING ERASE OSC
IC101
IC102
REC/PB AMP
VIDEO 5V
(See Page 205)
TL-26 BOARD
TALLY LED
W956
LED +8
W954
VF-19BOARD
EVF
W951
EVF 5V
CN205
(See Page 205)
L228
CN002
W605
BATT SENSE
CAM ON
VTR ON
VTR UNREG
EVF 5V
REG 5V
VIDEO 5V
CAM UNREG
VTR DC-DC CONV
CN901
CN001
F903
F901
F902
VTR UNREG
CAM UNREG
MOTOR UNREG
MAIN BATTERY
BATTERY TERMIANAL
(See Page 184)
CAPSTAN DORUM MOTOR DRIVE
CAMERA DC-DC CONV
CN003
AF UNREG
CAM 5V
23V
15V
-9V
(See Page 184)
DC-DC CONVERTER
SS 5V
Q205,220,241, Q237-239
REC Y REC C AMP
Q236
L229
IC205
EXPANTION PORT
PB+POWER SAVE
PB
PB+HNE REC
Q256
Q233-235, Q245-249
PB Y PB C AMP
Q232
IC201
·INPUT SELECT ·AGC ·VIDEO OUT
Q207
IC202
CCD COMB FILTER
IC203
Y/C PROCESS
Q226
VIDEO
PS601
IC602
5V REG
EVER 5V
PS602
SERVO / SYSCON
Q614-616
DEW DETECT
WAKE-UP
Q612,613
IC603
RESET
L602
IC607
L503
SP/LP DET CLOG DET
IC503
CAPSTAN /DRUM FG/PG AMP
IC505
L504
ATF SERVO
IC501
IC502
DRUM MOTOR DRIVE
VTR UNREG
Q617,618
TAPE TOP/END DETECT
IC504
CAPSTAN MOTOR DRIVE
Q622,624
LED DRIVE
CAPSTAN ERROR AMP REEL FG AMP
Q681,682
5V REG
IC605
LOADING MOTOR DRIVE
Vcc
IC604 (1/2)
5V REG
IC701
ZOOM MOTOR DRIVE
IC704
IRIS DRIVE HALL AMP
IC702
FG AMP
LD-11 BOARD
(See Page 153)
L701
W701
CN805
IC703
FOCUS MOTOR DRIVE
AF UNREG
AUTO FOCUS
IC611
IC612
IC613
L611
AUTO FOCUS
L610
REF 1V REF 2V REG
IC615
A-D CONV
IC610
CAMERA REC
IC501
IC502
IC503
L501,509
Y PRE EMPHASIS Y FM MOD CHROMA CONV CHROMA EMPHASIS
CN802
W604
SERIAL CONT
EVER 5V
SS 5V
AUDIO 5V
W801
CAMERA
L251
IC251
CHROMA PROCESS
5V(A)
IC253
CLAMP & BLANKING
IC252
EVR
IC363
IC364
L362
AUTO WHITE BALANCE
IC301
L303
ENCODER
IC302
L301
EVR
L401
Q131,132
V SUB REG
L402
L403
L404
IC141
L142,143
5V(D)
SYNC GENERATOR
IC182
IC183
L181,182
CCD DELAY
IC181
MATRIX
IC303
TITLE A/D CONV
L361
SS5V
Q571-573
DC OUT SW & CURRENT LIMITER
IC361
EVR/ AUTO WHITE BALANCE CPU
TI-15 BOARD
(See Page 157)
IC802
CHRACTER GENERATOR
IC803
DIGITAL TITLE
IC801
TITLE MEMORY
CN803
CN801
L804
L801
DDS +8
Q569
Q570
L561
SS 5V DETECT
Vcc
Vcc
(See Page 149)
CD-14BOARD
IC901
CCD IMAGER
CN301
CN302
V SUB
(See Page 208)
DT-74 BOARD
L101
L102
·SIGNAL SEPALATION ·AGC/IRIS CONTROL ·TIMING GENERATOR ·V DRIVE
(See Page 113)
(See Page 124)

ge 159)(See Page 171)(See Page 181)
VIDEO
Q191–193 FLYING ERASE OSC
IC101 IC102 REC/PB AMP
VIDEO 5V
SERVO / SYSCON
IC601 SERVO/SYSTEM CONTROL
EVER 5V
AV REF
AV DD
MNI
VDD
VPP
L601
Q614–616 DEW DETECT
WAKE-UP Q612,613
BATT SENS
IC602 5V REG
PS601
EVER 5V
IC603 RESET
RESET
Q611
CAM ON
VTR ON
VTR UNREG
SS 5V
CAM UNREG
D606
LINCS POWER
L602
IC607 SP/LP DET CLOG DET
L503
IC503 CAPSTAN /DRUM FG/PG AMP
IC505 ATF SERVO
L504
IC501 IC502 DRUM MOTOR DRIVE
VTR UNREG
Q617,618 TAPE TOP/END DETECT
IC504 CAPSTAN MOTOR DRIVE
Q622,624 LED DRIVE
CAPSTAN ERROR AMP REEL FG AMP
IC605 LOADING MOTOR DRIVE
PS602
Q681,682 5V REG
IC604 (1/2) 5V REG
Vcc
L229
IC205 EXPANTION PORT
SS 5V
PB+POWER SAVE
PB
PB+HNE REC
Q256
IC201 INPUT SELECT AGC VIDEO OUT
IC202 CCD COMB FILTER
Q226
IC203 Y/C PROCESS
IC701 ZOOM MOTOR DRIVE
AF UNREG
IC703 FOCUS MOTOR DRIVE
IC704 IRIS DRIVE HALL AMP
IC702 FG AMP
CAM 5V
L701
W701
CN805
LD-11 BOARD
(See Page 153)
AUTO FOCUS
IC611 IC612 IC613
L611 AUTO FOCUS
IC615
L610 REF 1V REF 2V REG
IC610 A-D CONV
CAMERA REC
IC501 IC502 IC503
L501,509 Y PRE EMPHASIS Y FM MOD CHROMA CONV CHROMA EMPHASIS
CN802 W604
SERIAL CONT
EVER 5V
SS 5V
AUDIO 5V
L251
CAMERA
IC251 5V(A) CHROMA PROCESS
IC253 5V(A) CLAMP & BLANKING
IC252 5V(A) EVR
IC141 SYNC GENERATOR
IC182 IC183 5V(D) CCD DELAY
IC181 5V(A) MATRIX
IC363 IC364 L362 AUTO WHITE BALANCE
IC301 L303 ENCODER
IC302 L301 EVR
IC303 TITLE A/D CONV
L361 SS5V
IC361 EVR/ AUTO WHITE BALANCE CPU
EVER 5V
Q131,132 V SUB REG
L401 L402 L404 L403
L142,143 L181,182
L101 L102
5V(A) -9V 5V(D) 15V
(See Page 208)
DT-74 BOARD
SIGNAL SEPALATION
AGC/IRIS CONTROL
TIMING GENERATOR
V DRIVE
Q571–573 DC OUT SW & CURRENT LIMITER
AF UNREG
CN803 CN801
L804
IC802 CHRACTER GENERATOR
IC803 DIGITAL TITLE
IC801 TITLE MEMORY
L801
DDS +B
TI-15 BOARD
(See Page 157)
IC561 FEATURE CONTROL (DDS CPU)
VDD VDD
Q569 Q568
Q570 SS 5V DETECT
L561
CN804
L13V
SERIAL CONT
DC OUT
(See Page 113) (See Page 133)
(See Page 124) (See Page 143)
VC-60 BOARD
(See Page 193)
FK-9 SWITCH BLOCK
CN603
VTR POWER SW
CAM POWER SW
S901
VTR OFF CAMERA
S909 LOCK/STANDBY
(See Page 193)
FP-115 BOARD
CN602 SENSOR COM(+) W902
H991,992 T REEL S REEL SENSOR
(See Page 189)
AU-51 BOARD
CN203 AUDIO 5V CN401
L401
AUDIO IC401
CN402 MIC 5V CN405
Q401–405, Q481 MIC AMP
MA-32 BOARD
(See Page 189)
(See Page 192)
CF-4 SWITCH BLOCK
CN751 CN753
LITHIUM BATTERY
CN752
(See Page 189)
EL-1 BOARD
CN942
L942 L941
J902 REMOTE

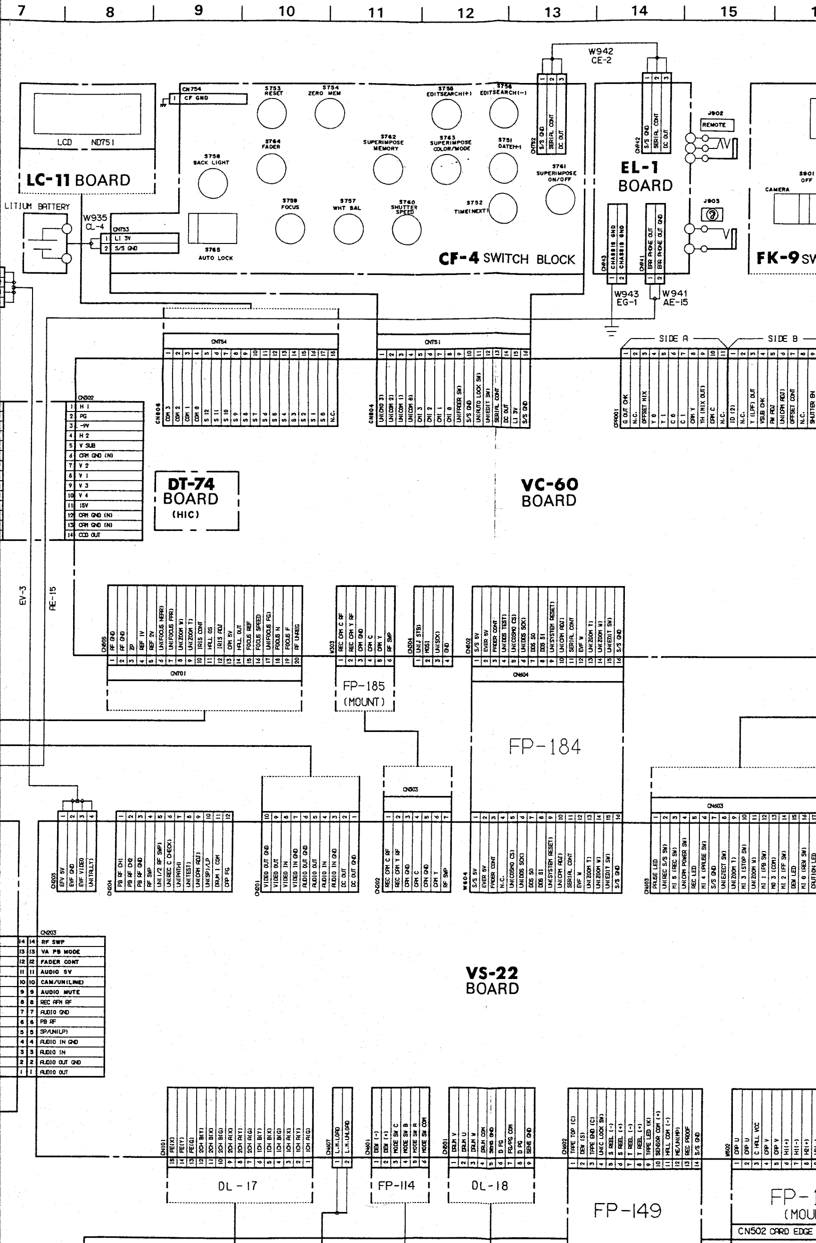
SECTION 4

PRINTED WIRING BOARDS AND S

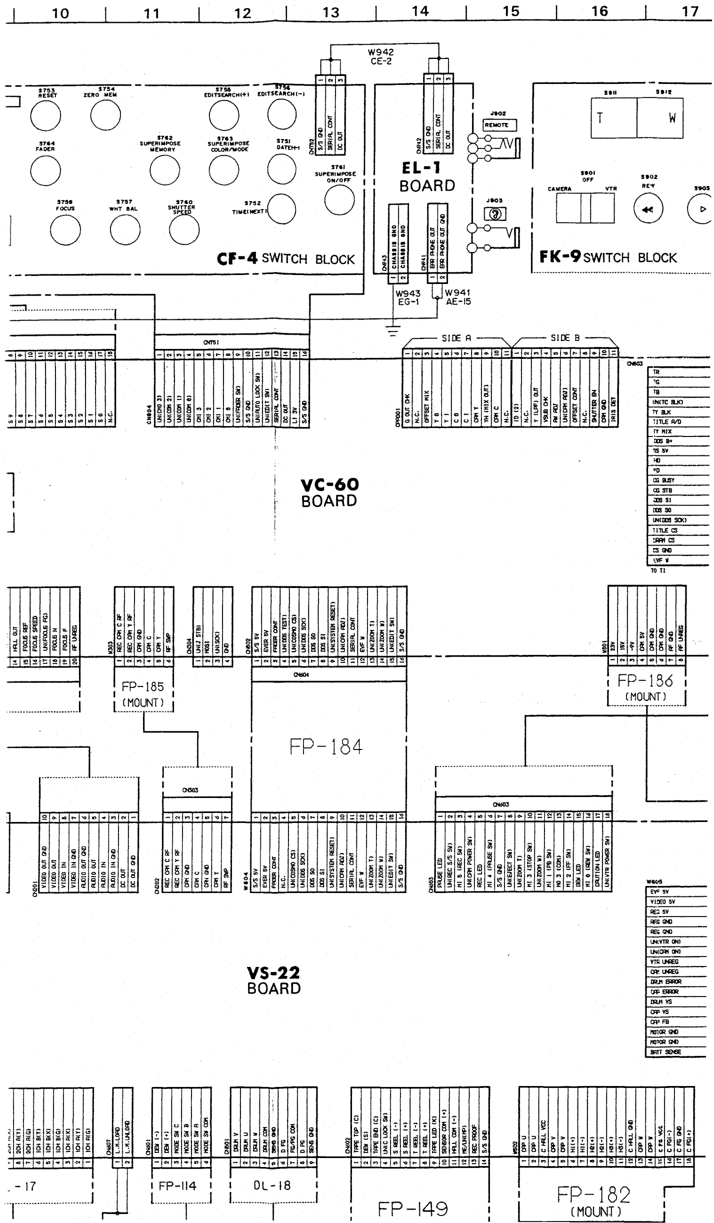
4-1. FRAME SCHEMATIC DIAGRAM

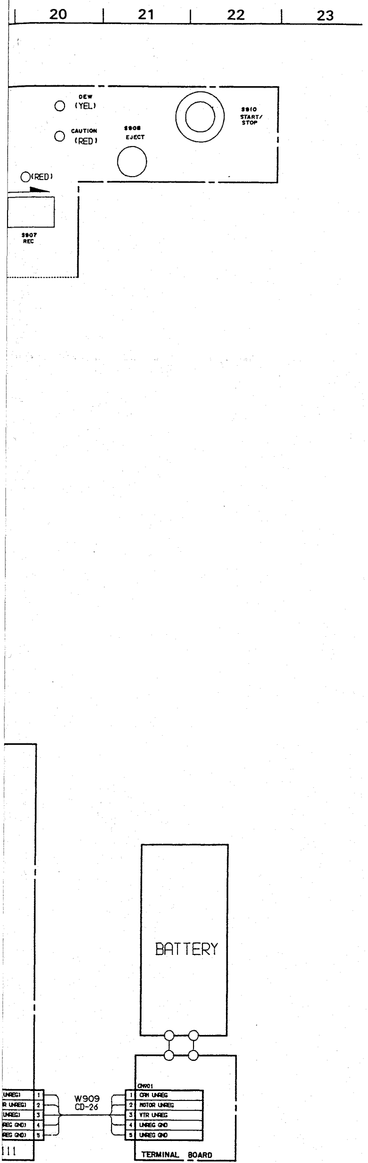

1
2
3
4
A
B
C
D
E
F
G
H
I
J
K
L
M
INT TALLY
D952
W955
LED +B
1
W956
UN(TALLY)
1
TL-26
BOARD
W953
1
LED +B
W954
1
UN(TALLY)
D951
EXT TALLY
W952
VF-19
BOARD
CN704
3
2
1
UN(FOCUS FAR)
UN(FOCUS NEAR)
GND
CN705
3
2
1
TP
WP
ZP
CN703
4
3
2
1
FOCUS FD
FOCUS ND
ZOOM W D
ZOOM T D
CN702
8
7
6
5
4
3
2
1
DRIVE (+)
DRIVE (-)
CONT (+)
CONT (-)
HALL (-)
BIAS (-)
HALL (+)
BIAS (+)
LD-11 BOARD
W701
AF GND
AF GND
1
2
ELECTRET CONDENSER MICROPHONE
MIC A
MIC B
CN404
1 MIC A GND
2 INT MIC A
3 INT MIC B
4 MIC B GND
MA-32
BOARD
W402
MC-16
CN405
MIC 5V 1
MIC IN 2
MIC GND 3
J904
MIC PLUG IN POWER
J901
V
RFU DC OUT
A
JK-40
BOARD
S921
OUTPUT
INPUT

S



7
8
9
10
11
12
13
14
15
LCD ND751
LC-11 BOARD
LITIUM BATTERY
W935 CL-4
CN753
1 LI 3V
2 S/S GND
CN754
1 CF GND
S753 RESET
S754 ZERO MEM
S755 EDITSEARCH(+)
S756 EDITSEARCH(−)
S764 FADER
S762 SUPERIMPOSE MEMORY
S763 SUPERIMPOSE COLOR/MODE
S751 DATE(+)
S758 BACK LIGHT
S761 SUPERIMPOSE ON/OFF
S759 FOCUS
S757 WHT BAL
S760 SHUTTER SPEED
S752 TIME(NEXT)
S765 AUTO LOCK
CF-4 SWITCH BLOCK
CN752
S/S GND
SERIAL CONT
DC OUT
W942 CE-2
CN942
S/S GND
SERIAL CONT
DC OUT
EL-1 BOARD
J902 REMOTE
J903
CN943
CHASSIS GND
CHASSIS GND
CN941
EAR PHONE OUT
EAR PHONE OUT GND
W943 EG-1
W941 AE-15
CAMERA
S901 OFF
FK-9 SW
CN754
CN806
COM 3
COM 2
COM 1
COM 0
S 12
S 11
S 10
S 9
S 8
S 7
S 6
S 5
S 4
S 3
S 2
S 1
S 0
N.C.
CN751
CN804
UN(COM 3)
UN(COM 2)
UN(COM 1)
UN(COM 0)
CH1 3
CH1 2
CH1 1
CH1 0
UN(FADER SW)
S/S GND
UN(AUTO LOCK SW)
UN(EDIT SW)
SERIAL CONT
DC OUT
LI 3V
S/S GND
SIDE A
SIDE B
CP001
G OUT CHK
N.C.
OFFSET MIX
Y 0
Y 1
C 0
C 1
CAM Y
YH (MIX OUT)
CAM C
N.C.
ID (2)
N.C.
Y (LPF) OUT
VSUB CHK
AW ADJ
UN(CAM ADJ)
OFFSET CONT
N.C.
SHUTTER EN
CN302
1 H 1
2 PG
3 -9V
4 H 2
5 V SUB
6 CAM GND (N)
7 V 2
8 V 1
9 V 3
10 V 4
11 15V
12 CAM GND (N)
13 CAM GND (N)
14 CCD OUT
DT-74 BOARD (HIC)
VC-60 BOARD
EV-3
AE-15
CN605
AF GND
AF GND
ZP
REF 1V
REF 2V
UN(FOCUS NEAR)
UN(FOCUS FAR)
UN(ZOOM W)
UN(ZOOM T)
IRIS CONT
HALL OS
IRIS ADJ
CAM 5V
HALL OUT
FOCUS REF
FOCUS SPEED
UN(FOCUS FG)
FOCUS N
FOCUS F
AF UNREG
CN701
W303
REC CAM C RF
REC CAM Y RF
CAM GND
CAM C
CAM Y
RF SWP
FP-185 (MOUNT)
CN504
UN(J STB)
MOSI
UN(SCK)
GND
CN602
S/S 5V
EVER 5V
FADER CONT
UN(DDS TEST)
UN(COSMO CS)
UN(DDS SCK)
DDS S0
DDS S1
UN(SYSTEM RESET)
UN(CAM ADJ)
SERIAL CONT
EVF W
UN(ZOOM T)
UN(ZOOM W)
UN(EDIT SW)
S/S GND
CN604
FP-184
CN303
CN603
CN205
EVF 5V
EVF GND
EVF VIDEO
UN(TALLY)
CN204
PB RF CH1
PB RF CH2
PB RF GND
PB RF GND
RF SWP
UN(1/2 RF SWP)
UN(REC C CHECK)
UN(PATH)
UN(TEST)
UN(CAM ADJ)
UN(SP)/LP
DRUM 1 COM
CAP FG
CN201
VIDEO OUT GND
VIDEO OUT
VIDEO IN
VIDEO IN GND
AUDIO OUT GND
AUDIO OUT
AUDIO IN
AUDIO IN GND
DC OUT
DC OUT GND
CN202
REC CAM C RF
REC CAM Y RF
CAM GND
CAM C
CAM GND
CAM Y
RF SWP
W604
S/S 5V
EVER 5V
FADER CONT
N.C.
UN(COSMO CS)
UN(DDS SCK)
DDS S0
DDS S1
UN(SYSTEM RESET)
UN(CAM ADJ)
SERIAL CONT
EVF W
UN(ZOOM T)
UN(ZOOM W)
UN(EDIT SW)
S/S GND
CN603
PAUSE LED
UN(REC S/S SW)
MI 5 (REC SW)
UN(CAM POWER SW)
REC LED
MI 4 (PAUSE SW)
S/S GND
UN(EJECT SW)
MI 3 (STOP SW)
UN(ZOOM W)
MI 1 (PB SW)
MO 3 (COM)
MI 2 (FF SW)
DEW LED
MI 0 (REW SW)
CAUTION LED
CN203
14 14 RF SWP
13 13 VA PB MODE
12 12 FADER CONT
11 11 AUDIO 5V
10 10 CAM/UN(LINE)
9 9 AUDIO MUTE
8 8 REC AFM RF
7 7 AUDIO GND
6 6 PB RF
5 5 SP/UN(LP)
4 4 AUDIO IN GND
3 3 AUDIO IN
2 2 AUDIO OUT GND
1 1 AUDIO OUT
VS-22 BOARD
CN101
FE(X)
FE(Y)
FE(G)
2CH B(Y)
2CH B(X)
2CH B(G)
2CH A(X)
2CH A(Y)
2CH A(G)
1CH B(Y)
1CH B(X)
1CH B(G)
1CH A(X)
1CH A(Y)
1CH A(G)
DL-17
CN407
L.M.LOAD
L.M.UNLOAD
CN401
DEW (−)
DEW (+)
MODE SW C
MODE SW B
MODE SW A
MODE SW COM
FP-114
CN501
DRUM V
DRUM U
DRUM W
DRUM COM
SENS GND
D FG
FG/PG COM
D PG
SENS GND
DL-18
CN402
TAPE TOP (C)
DEW (S)
TAPE END (C)
UN(C LOCK SW)
S REEL (−)
S REEL (+)
T REEL (−)
T REEL (+)
TAPE LED (K)
SENSOR COM (+)
HALL COM (−)
ME/UN(MP)
REC PROOF
S/S GND
FP-149
W502
CAP U
CAP U
C HALL VCC
CAP V
CAP V
H1(+)
H1(−)
H2(+)
FP-1
(MOU
CN502 CARD EDGE


10
11
12
13
14
15
16
17
W942
CE-2
S753 RESET
S754 ZERO MEM
S755 EDITSEARCH(+)
S756 EDITSEARCH(−)
S764 FADER
S762 SUPERIMPOSE MEMORY
S763 SUPERIMPOSE COLOR/MODE
S751 DATE(+)
S761 SUPERIMPOSE ON/OFF
S759 FOCUS
S757 WHT BAL
S760 SHUTTER SPEED
S752 TIME(NEXT)
CF-4 SWITCH BLOCK
CN752 1 S/S GND 2 SERIAL CONT 3 DC OUT
CN942 1 S/S GND 2 SERIAL CONT 3 DC OUT
EL-1 BOARD
J902 REMOTE
J903
CN943 1 CHASSIS GND 2 CHASSIS GND
CN941 1 EAR PHONE OUT 2 EAR PHONE OUT GND
W943 EG-1
W941 AE-15
S911 T
S912 W
S901 OFF CAMERA VTR
S902 REW
S903
FK-9 SWITCH BLOCK
8 S 9
9 S 8
10 S 7
11 S 6
12 S 5
13 S 4
14 S 3
15 S 2
16 S 1
17 S 0
18 N.C.
CN751
CN804
1 UN(CH0 3)
2 UN(COH 2)
3 UN(COH 1)
4 UN(COH 0)
5 CHI 3
6 CHI 2
7 CHI 1
8 CHI 0
9 UN(FADER SW)
10 S/S GND
11 UN(AUTO LOCK SW)
12 UN(EDIT SW)
13 SERIAL CONT
14 DC OUT
15 LI 5V
16 S/S GND
SIDE A
SIDE B
CPA001
1 G OUT CHK
2 N.C.
3 OFFSET MIX
4 Y 0
5 Y 1
6 C 0
7 C 1
8 CAM Y
9 YH (MIX OUT)
10 CAM C
11 N.C.
1 ID (2)
2 N.C.
3 Y (LPF) OUT
4 VSUB CHK
5 AW ADJ
6 UN(CAM ADJ)
7 OFFSET CONT
8 N.C.
9 SHUTTER EN
10 CAM GND
11 IRIS DET
CN603
TR
TG
TB
UN(TC BLK)
TY BLK
TITLE A/D
TY MIX
DDS B+
SS 5V
HD
VD
CG BUSY
CG STB
DDS S1
DDS S0
UN(DDS SCK)
TITLE CS
SRAM CS
SS GND
EVF W
TO TI
VC-60 BOARD
14 HALL OUT
15 FOCUS REF
16 FOCUS SPEED
17 UN(FOCUS FG)
18 FOCUS N
19 FOCUS F
20 AF UNREG
W303
1 REC CAM C RF
2 REC CAM Y RF
3 CAM GND
4 CAM C
5 CAM Y
6 RF SWP
FP-185 (MOUNT)
CN304
1 UN(J STB)
2 MOSI
3 UN(SCK)
4 GND
CN802
1 S/S 5V
2 EVER 5V
3 FADER CONT
4 UN(DDS TEST)
5 UN(COSMO CS)
6 UN(DDS SCK)
7 DDS S0
8 DDS S1
9 UN(SYSTEM RESET)
10 UN(CAM ADJ)
11 SERIAL CONT
12 EVF W
13 UN(ZOOM T)
14 UN(ZOOM W)
15 UN(EDIT SW)
16 S/S GND
CN604
FP-184
W801
1 23V
2 18V
3 -9V
4 CAM 5V
5 CAM GND
6 CAM GND
7 AF GND
8 AF UNREG
FP-186 (MOUNT)
CN201
10 VIDEO OUT GND
9 VIDEO OUT
8 VIDEO IN
7 VIDEO IN GND
6 AUDIO OUT GND
5 AUDIO OUT
4 AUDIO IN
3 AUDIO IN GND
2 DC OUT
1 DC OUT GND
CN303
CN202
1 REC CAM C RF
2 REC CAM Y RF
3 CAM GND
4 CAM C
5 CAN GND
6 CAM Y
7 RF SWP
W604
1 S/S 5V
2 EVER 5V
3 FADER CONT
4 N.C.
5 UN(COSMO CS)
6 UN(DDS SCK)
7 DDS S0
8 DDS S1
9 UN(SYSTEM RESET)
10 UN(CAM ADJ)
11 SERIAL CONT
12 EVF W
13 UN(ZOOM T)
14 UN(ZOOM W)
15 UN(EDIT SW)
16 S/S GND
CN603
CN603
1 PAUSE LED
2 UN(REC S/S SW)
3 MI 5 (REC SW)
4 UN(CAM POWER SW)
5 REC LED
6 MI 4 (PAUSE SW)
7 S/S GND
8 UN(EJECT SW)
9 UN(ZOOM T)
10 MI 3 (STOP SW)
11 UN(ZOOM W)
12 MI 1 (PB SW)
13 MO 3 (COM)
14 MI 2 (FF SW)
15 DEW LED
16 MI 0 (REW SW)
17 CAUTION LED
18 UN(VTR POWER SW)
W605
EVF 5V
VIDEO 5V
REG 5V
REG GND
REG GND
UN(VTR ON)
UN(CAM ON)
VTR UNREG
CAM UNREG
DRUM ERROR
CAP ERROR
DRUM VS
CAP VS
CAP FB
MOTOR GND
MOTOR GND
BATT SENSE
VS-22 BOARD
8 2CH A(Y)
7 2CH A(G)
6 1CH B(Y)
5 1CH B(X)
4 1CH B(G)
3 1CH A(X)
2 1CH A(Y)
1 1CH A(G)
-17
CN607
1 L.M.LOAD
2 L.M.UNLOAD
CN601
1 DEW (−)
2 DEW (+)
3 MODE SW C
4 MODE SW B
5 MODE SW A
6 MODE SW COM
FP-114
CN501
1 DRUM V
2 DRUM U
3 DRUM W
4 DRUM COM
5 SENS GND
6 D FG
7 FG/PG COM
8 D PG
9 SENS GND
DL-18
CN602
1 TAPE TOP (C)
2 DEW (S)
3 TAPE END (C)
4 UN(C LOCK SW)
5 S REEL (−)
6 S REEL (+)
7 T REEL (−)
8 T REEL (+)
9 TAPE LED (K)
10 SENSOR COM (+)
11 HALL COM (−)
12 ME/UN(MP)
13 REC PROOF
14 S/S GND
FP-149
W502
1 CAP U
2 CAP U
3 C HALL VCC
4 CAP V
5 CAP V
6 H1(+)
7 H1(−)
8 H2(+)
9 H2(−)
10 H3(+)
11 H3(−)
12 C HALL GND
13 CAP W
14 CAP W
15 C FG VCC
16 C FG(−)
17 C FG GND
18 C FG(+)
FP-182 (MOUNT)


20
21
22
23
DEW
(YEL)
CAUTION
(RED)
S908
EJECT
S910
START/
STOP
(RED)
S907
REC
BATTERY
UNREG)
R UNREG)
UNREG)
REG GND)
REG GND)
W909
CD-26
CN901
CAM UNREG
MOTOR UNREG
VTR UNREG
UNREG GND
UNREG GND
TERMINAL BOARD

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.

(In addition to this , the necessary note is printed in each block.)

- **For printed wiring boards.**
- ○— : indicated a lead wire mounted on the component side.
- —— : indicated a lead wire mounted on the conductor side.
- ■ : Parts mounted on the conductor side.
- ▨ : Pattern from the side which enables seeing.
- ▬ : Pattern of the rear side.*

  } The inner two layers' patterns are not indicated.
- Circled numbers refer to waveforms.*
- (B) or (F), etc. of capacitors indicate the temperature characteristics.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.

- **For schematic diagrams.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minuts side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W unless otherwise noted.
  Chip resistor are 1/16W unless otherwise noted.
  kΩ : 1000Ω , MΩ : 1000kΩ .
- All capacitors are in μF unless otherwise noted. pF: μμF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ☐ : panel designation.
- △ : internal component.
- ☐ : adjustment for repair.*
- —— : B+ Line.*
- - - - : B– Line*.
- ⇨ : IN/OUT direction of (+, –) B LINE.*
- Circled numbers refer to waveforms.*

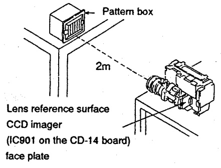
Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safty. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

• Measuring conditions voltage value and wav
(CAMERA, DIGITAL TITLE block)

- The object is color bar chart of pattern box.
- Voltages are dc between ground and measurement p
  Readings are taken with a digital multimeter (DC 10M
- Voltage variations may be noted due to normal tolerances.*

1. Connection


Pattern box
2m
Lens reference surface
CCD imager
(IC901 on the CD-14 board)
face plate

2. Adjust the distance so that the output waveform of the Fig. b can be obtain.

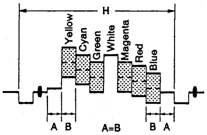

H
Yellow
Cyan
Green
White
Magenta
Red
Blue
A B
A=B
B A

Fig. a (Video output terminal output waveform

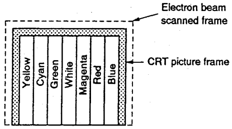

Electron beam scanned frame
CRT picture frame
Yellow
Cyan
Green
White
Magenta
Red
Blue

Fig. b (Picture on monitor TV)

(VIDEO, SERVO/SYSTEM CONTROL, MODE CC
VIEW FINDER block)

- Voltages are dc between ground and measurement pı
- Readings are taken with a color-bar signal input.*
- Readings are taken with a digital multimeter (DC10MΩ
- Voltage variations may be noted due to normal tolerances.*

- *: indicated by the color red.

FRAME

VC-60 (CAMERA) PRINTED WIRING BOARDS

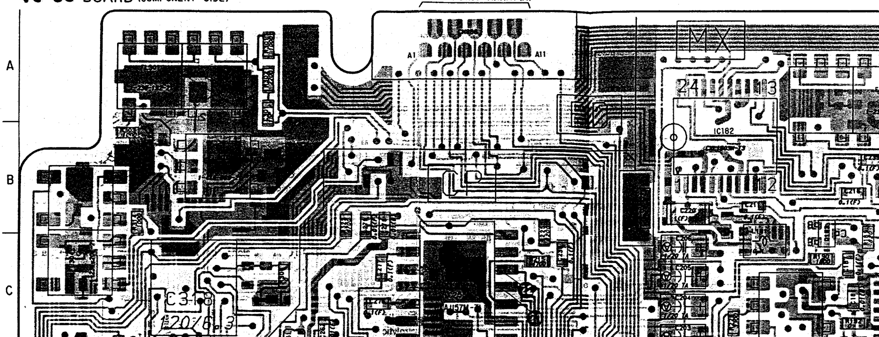
— Ref. No. VC-60 BOARD: 2000 series —

- **For printed wiring boards.**
- VC-60 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

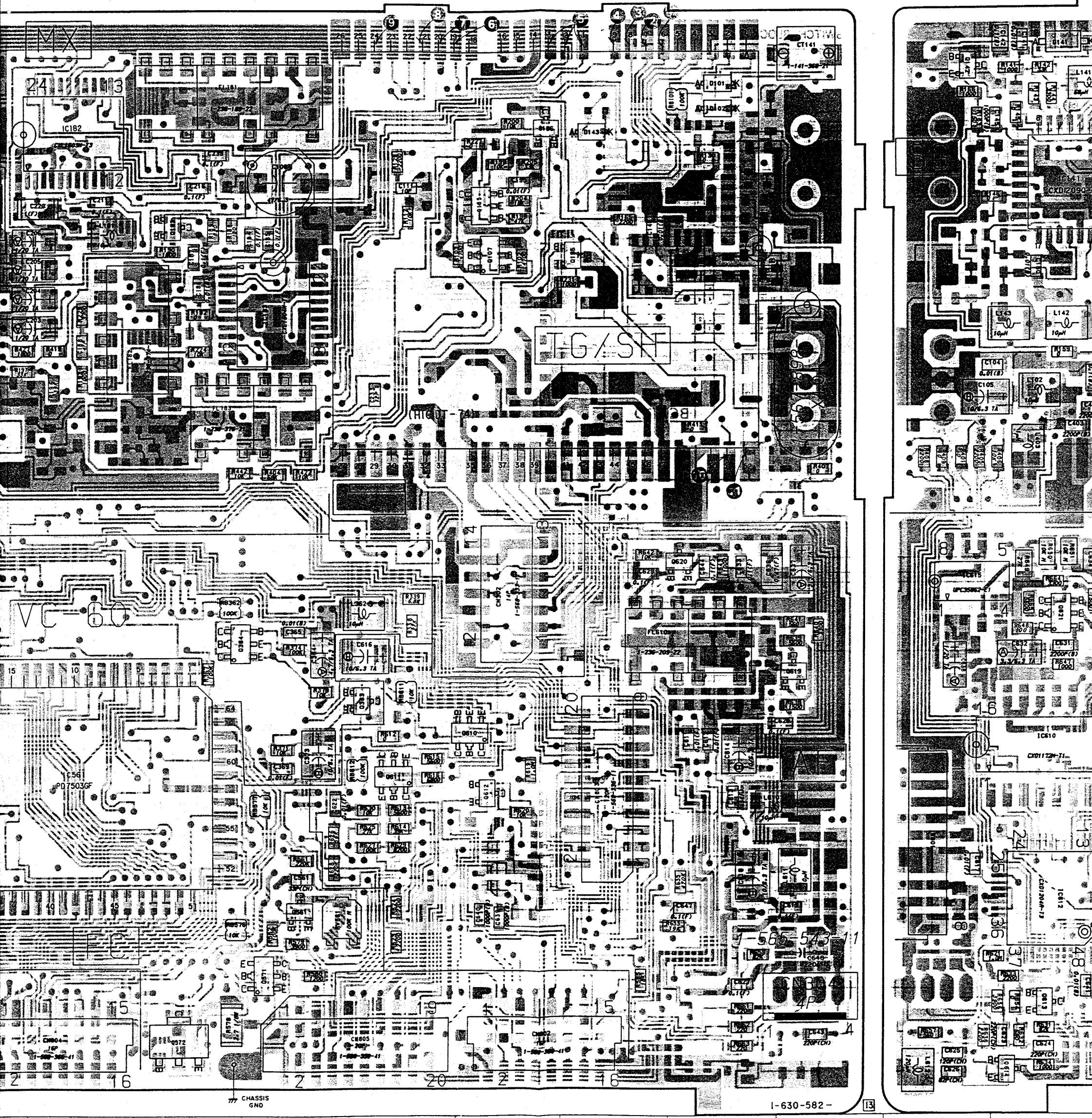
Caution:

Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.

VC-60 BOARD (COMPONENT SIDE)

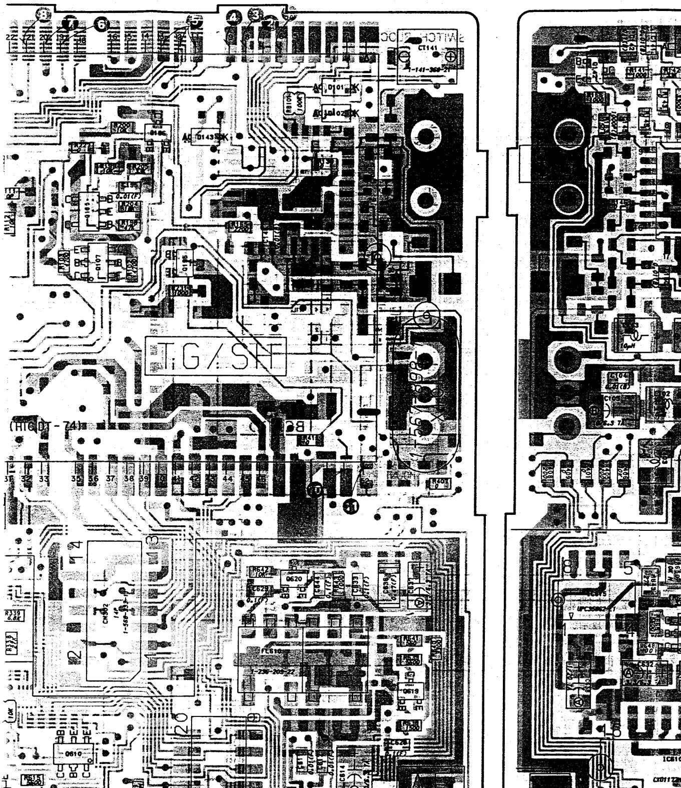

CHECK POINT ARRAY(A)
A1
A11
A
B
C
MX
24
13
12
IC182
C318
IC2076-3
C205
C204

VC-60 BOARD (CONDUCTOR SIDE)

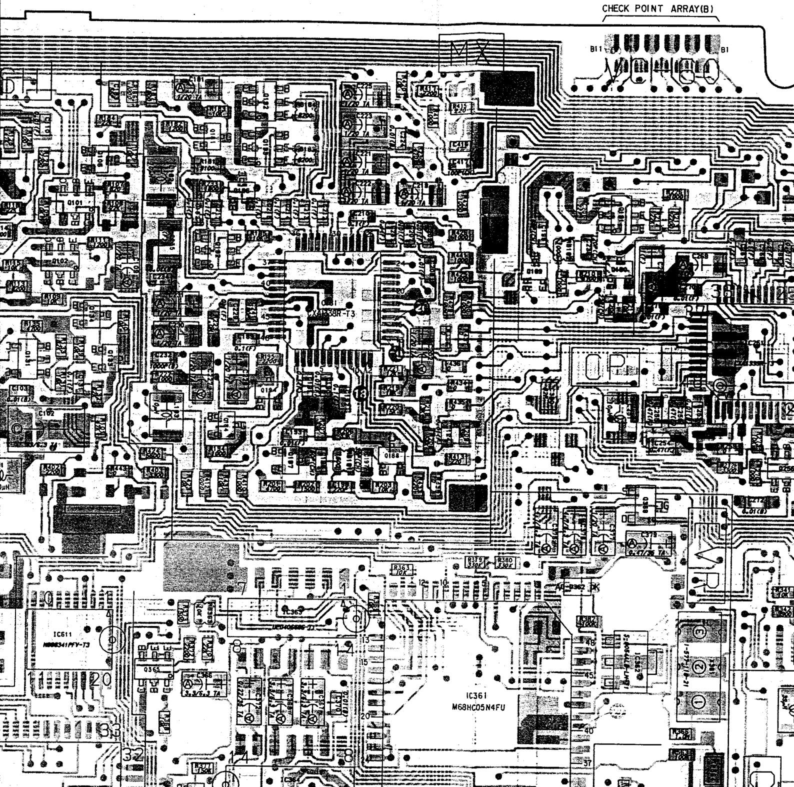


MX
IC182
TG/SH
VC-60
FC
IC561
μPD7503GF
IC141
CXD1209
IC610
CXD1172M-T1
UPC3506
1-565-543-11
CN804
CN805
CN802
CHASSIS GND
1-630-582-
13
7
8
9
10
11
12
13
14
15
16

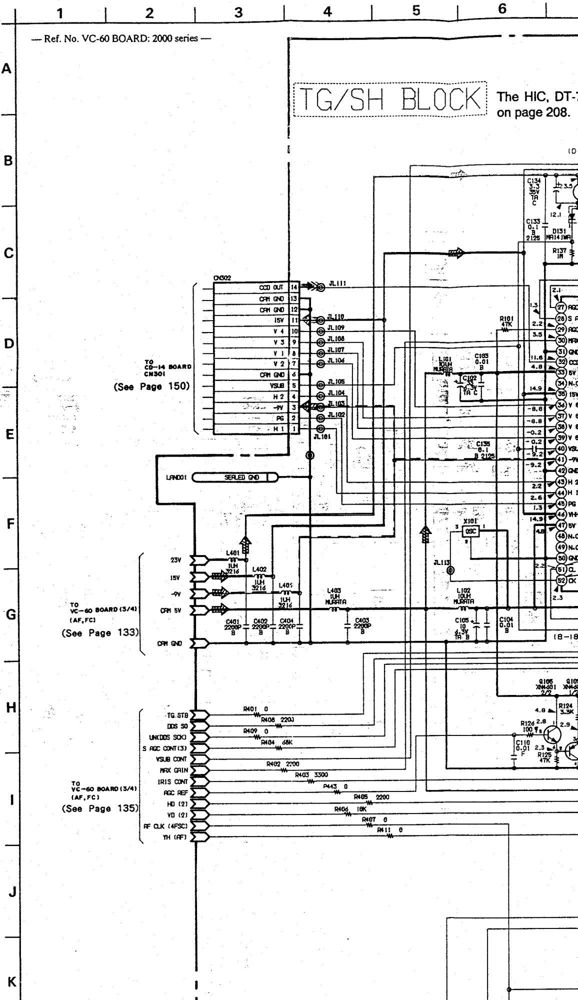
VC-60 BOARD (CONDUCTOR



T.G/SH
(HIC0T-74)
CT141
1-141-368-21
D101
D102
D143
Q106
Q107
Q186
Q620
Q619
Q610
CN302
FL610
1-236-209-22
R339
6.8K
IC801
UPC3086C

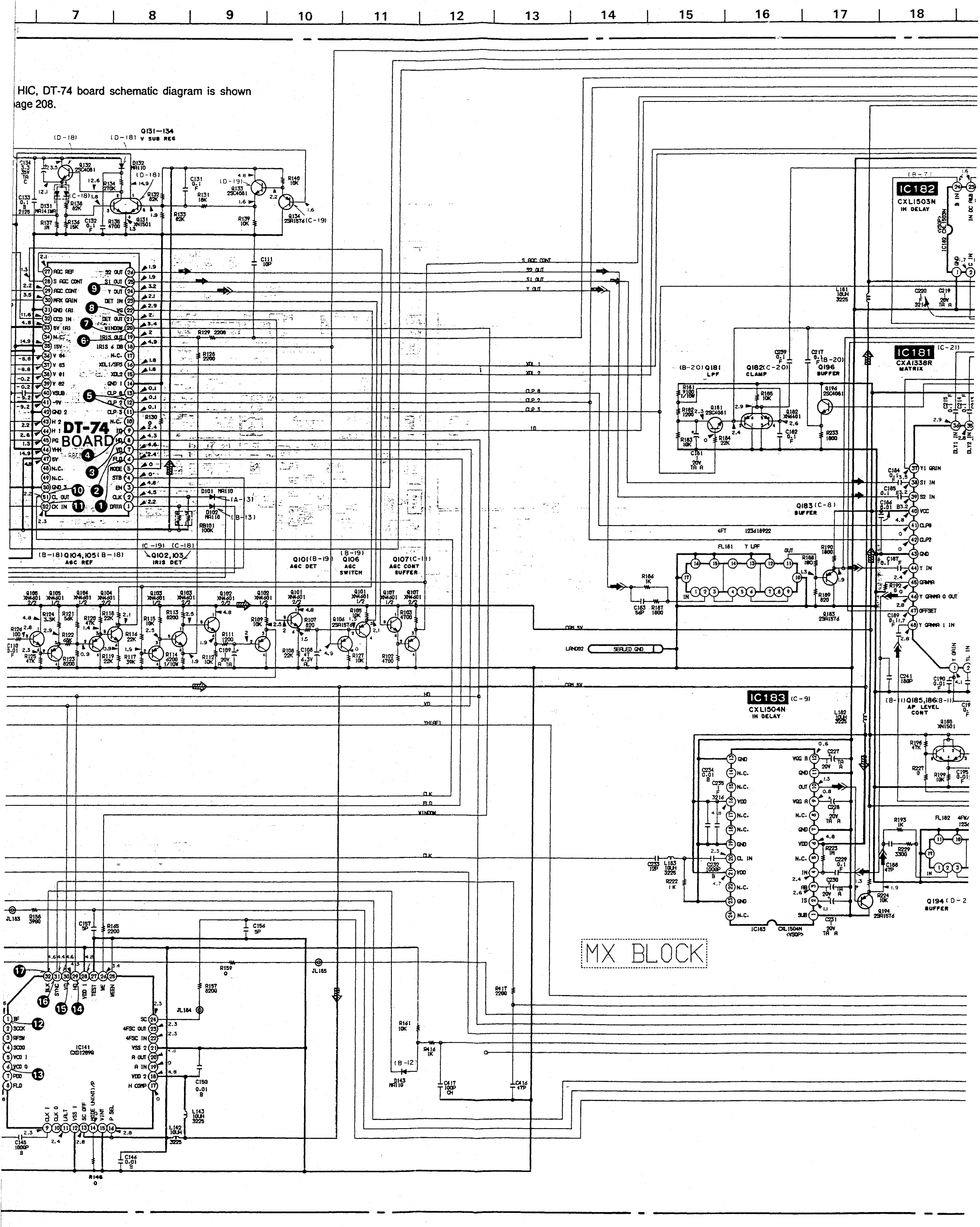

CHECK POINT ARRAY(B)
B11
B1
Q101
Q102
C102
IC611
Q361
C366
IC363
R363
10K
R379
330K
R380
330K
IC361
M68HC05N4FU

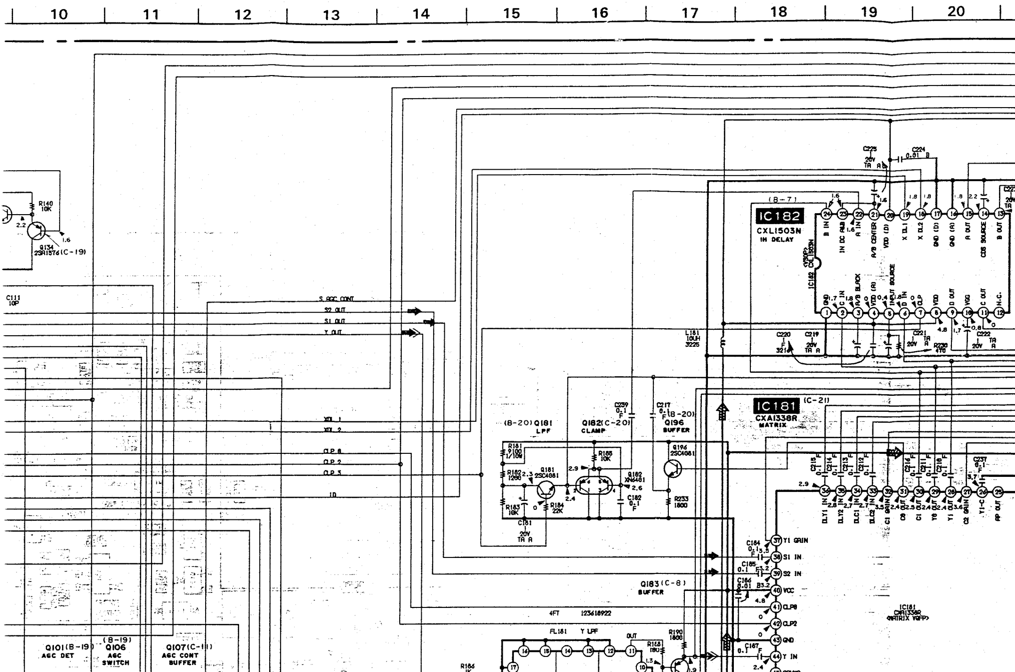
— Ref. No. VC-60 BOARD: 2000 series —

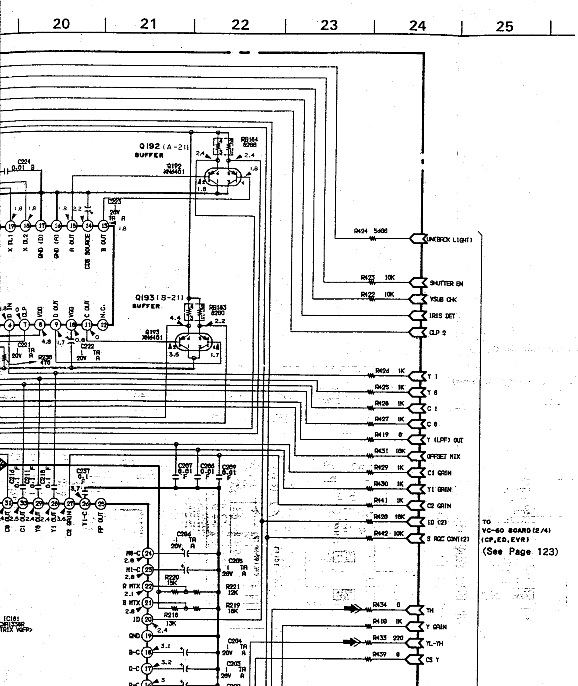

1
2
3
4
5
6
A
B
C
D
E
F
G
H
I
J
K
TG/SH BLOCK
CN302
CCD OUT
CAM GND
CAM GND
15V
V 4
V 3
V 1
V 2
CAM GND
VSUB
H 2
-9V
PG
H 1
TO CD-14 BOARD CN301
(See Page 150)
JL111
JL110
JL109
JL108
JL107
JL106
JL105
JL104
JL103
JL102
JL101
LAND01
SEALED GND
23V
15V
-9V
CAM 5V
CAM GND
TO VC-60 BOARD (3/4) (AF,FC)
(See Page 133)
L401 1UH 3216
L402 1UH 3216
L404 1UH 3216
L403 1UH MURATA
C401 2200P B
C402 2200P B
C404 2200P B
C403 2200P B
TG STB
DDS SO
UNIDDS SCK)
S AGC CONT(3)
VSUB CONT
MAX GAIN
IRIS CONT
AGC REF
HD (2)
VD (2)
AF CLK (4FSC)
YH (AF)
TO VC-60 BOARD (3/4) (AF,FC)
(See Page 135)
R401 0
R408 2200
R409 0
R404 68K
R402 2200
R403 3300
R443 0
R405 2200
R406 18K
R407 0
R411 0
L101 10UH MURATA
C103 0.01 B
C102 6.3V TA C
C135 0.1 B 2125
X101 OSC
JL113
L102 10UH MURATA
C105 10 6.3V TA B
C104 0.01 B
C134 3.3 35V TA C
C133 0.1 B 2125
D131 MA141WA
R137 1M
R101 47K
Q106 XN4601 2/2
R124 3.3K
R126 100
C110 0.01 F
R125 47K
27 AGC
28 S A
29 AGC
30 MAX
31 GND
32 CCD
33 5V
34 N.C
35 15V
36 V
37 V
38 V
39 V
40 VSU
41 -9V
42 GND
43 H 2
44 H 1
45 PG
46 VH
47 5V
48 N.C
49 N.C
50 GND
51 CL
52 CK
12.1
1.3
2.2
3.5
11.6
4.8
14.9
-8.8
-8.8
-0.2
-0.2
-9.2
-9.2
2.2
2.6
1.3
14.9
4.8
2.2
2.3
4.8
2.8
2.9
2.3
(B-18

The HIC, DT-
on page 208.

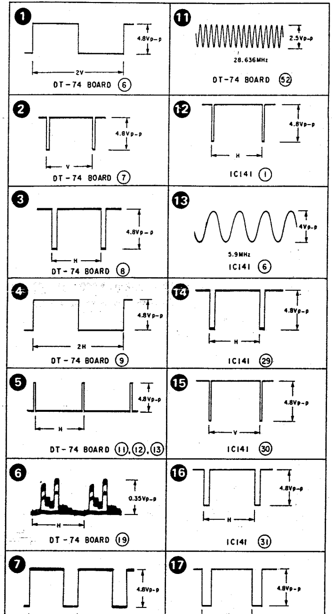
HIC, DT-74 board schematic diagram is shown
age 208.


7
8
9
10
11
12
13
14
15
16
17
18
Q131–134 V SUB REG
Q132 2SC4081
D132 MA110
Q131 XN1501
Q133 2SC4081
Q134 2SA1576
DT-74 BOARD
AGC REF
S AGC CONT
AGC CONT
MAX GAIN
CCD IN
VSUB
S2 OUT
S1 OUT
Y OUT
DET IN
WINDOW
IRIS OUT
CLP 1
CLP 2
CLP 3
HD
VD
FLD
MODE
STB
EN
CLK
DATA
CL OUT
CK IN
D101 MA110
D102 MA110
(B-18) Q104, 105 (B-18) AGC REF
(C-19) (C-18) Q102, 103 IRIS DET
Q101 (B-19) AGC DET
(B-19) Q106 AGC SWITCH
Q107 (C-11) AGC CONT BUFFER
S AGC CONT
S2 OUT
S1 OUT
Y OUT
XDL 1
XDL 2
CLP A
CLP 2
CLP 3
ID
CAM 5V
LAND02
SEALED GND
CAM 5V
HD
VD
YH(BE)
CLK
BLD
WINDOW
CLK
IC182 CXL1503N 1H DELAY
IC181 (C-21) CXA1338R MATRIX
(B-20) Q181 LPF
Q182 (C-20) CLAMP
Q196 BUFFER
Q183 (C-8) BUFFER
FL181 Y LPF
IC183 (C-9) CXL1504N 1H DELAY
IC183 CXL1504N (VSOP)
Q185, 186 (B-11) AP LEVEL CONT
Q194 (D-2) BUFFER
FL182
Y1 GAIN
S1 IN
S2 IN
VCC
CLPB
CLP2
GND
Y IN
GAMMA
Y GAMMA 0 OUT
OFFSET
Y GAMMA 1 IN
MX BLOCK
IC141 CXD1269Q
JL183
JL184
JL185
BLK
SYNC
VD
HD
VDD 1
TEST
WE
WEEN
BF
SCCK
RFSW
SCOO
VCO 1
VCO 0
PDO
FLD
SC
4FSC OUT
4FSC IN
VSS 2
R OUT
R IN
VDD 2
H COMP
CLK I
CLK O
LALT
VSS 1
SC OFF
MODE UN(NT)/P
POF
VINT
P SEL
D143 MA110
L142 10UH
L143 10UH


10
11
12
13
14
15
16
17
18
19
20
R140
10K
2.2
1.6
Q134
2SA1576(C-19)
C111
10P
S AGC CONT
S2 OUT
S1 OUT
Y OUT
XDL 1
XDL 2
CLP 0
CLP 2
CLP 3
ID
Q101(B-19)
AGC DET
(B-19)
Q106
AGC
SWITCH
Q107(C-11)
AGC CONT
BUFFER
(B-20) Q181
LPF
Q182(C-20)
CLAMP
C239
0.1
F
C217
0.1
F
(B-20)
Q196
BUFFER
R181
9100
1/10W
R182
1200
2.3
Q181
2SC4081
R183
10K
C181
1
20V
TA A
0
R184
22K
2.4
2.9
R185
10K
Q182
XN6401
2.6
C182
0.1
F
Q196
2SC4081
R233
1800
L181
10UH
3225
IC182
CXL1503N
1H DELAY
(B-7)
IC182
CXL1503N
<VSOP>
B IN
IN DC ALB
A IN
A/B CENTER
VDD (D)
X DL1
X DL2
GND (D)
GND (A)
A OUT
CDS SOURCE
B OUT
GND
C IN
A/B BLACK
VDD (A)
INPUT SOURCE
D IN
CLP
VDD
D OUT
VGG
C OUT
N.C.
C225
20V
TA A
C224
0.01 B
C220
1
F
3216
C219
1
20V
TA A
C221
1
20V
TA
A
R230
470
C222
1
20V
TA
A
4.8
1.7
0.8
0
IC181
(C-21)
CXA1338R
MATRIX
C215
0.1
F
C214
0.1
F
C213
0.1
F
C212
0.1
F
C216
0.1
F
C211
0.1
F
C210
0.1
F
C237
0.1
F
3.7
DLY1 IN
DLY2 IN
DLC1 IN
DLC2 IN
C1 GAIN
C0 OUT
C1 OUT
Y0 OUT
Y1 OUT
C2 GAIN
Y1-C
AP OUT
2.8
2.7
2.7
3.5
2.4
2.5
2.4
2.4
3.6
Y1 GAIN
S1 IN
S2 IN
VCC
CLP0
CLP2
GND
Y IN
C184
0.1
F
3.5
C185
0.1
F
3.2
C186
0.01
B
3.2
4.8
C187
0.1
F
2.4
IC181
CXA1338R
<MATRIX VQFP>
Q183(C-8)
BUFFER
4FT
123618922
FL181
Y LPF
OUT
R188
180
R190
1800
1.3
1.9
R186
1K


20
21
22
23
24
25
Q192 (A-21)
BUFFER
Q192 XN6401
RB184 8200
Q193 (B-21)
BUFFER
Q193 XN6401
RB183 8200
C224 0.01 B
C223 20V TA A
C221 1 20V TA A
C222 1 20V TA A
R230 470
X DL1
X DL2
GND (D)
GND (A)
A OUT
CDS SOURCE
B OUT
D IN
CLP
VDD
D OUT
VGG
C OUT
N.C.
R424 5600
UNIBACK LIGHT)
R423 10K
SHUTTER EN
R422 10K
VSUB CHK
IRIS DET
CLP 2
R426 1K
Y 1
R425 1K
Y 0
R428 1K
C 1
R427 1K
C 0
R419 0
Y (LPF) OUT
R431 10K
OFFSET MIX
R429 1K
C1 GAIN
R430 1K
Y1 GAIN
R441 1K
C2 GAIN
R420 10K
ID (2)
R442 10K
S AGC CONT(2)
R434 0
TH
R418 1K
Y GAIN
R433 220
YL-TH
R439 0
CS Y
C207 0.01 F
C208 0.01 F
C209 0.01 F
C214 0.1 F
C211 0.1 F
C218 0.1 F
C237 0.1 F
C206 1 20V TA A
C205 1 20V TA A
C204 1 20V TA A
C203 1 20V TA A
R220 15K
R221 12K
R219 18K
R218 13K
M0-C
M1-C
R MTX
B MTX
ID
GND
B-C
G-C
C0
C1
Y0
Y1 OUT
C2 GAIN
Y1-C
FP OUT
IC181
CXA1338R
MATRIX VQFP>
TO
VC-60 BOARD (2/4)
(CP,ED,EVR)
(See Page 123)

VC-60 BOARD (TG/SH, SG, MX)



VC-60 (CAMERA) PRINTED WIRING BOARDS

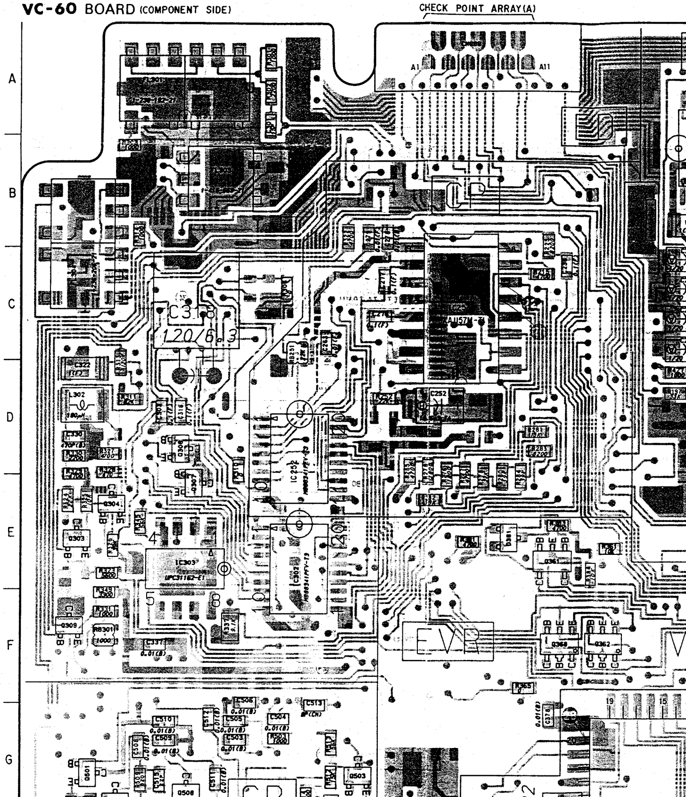
— Ref. No. VC-60 BOARD: 2000 series —

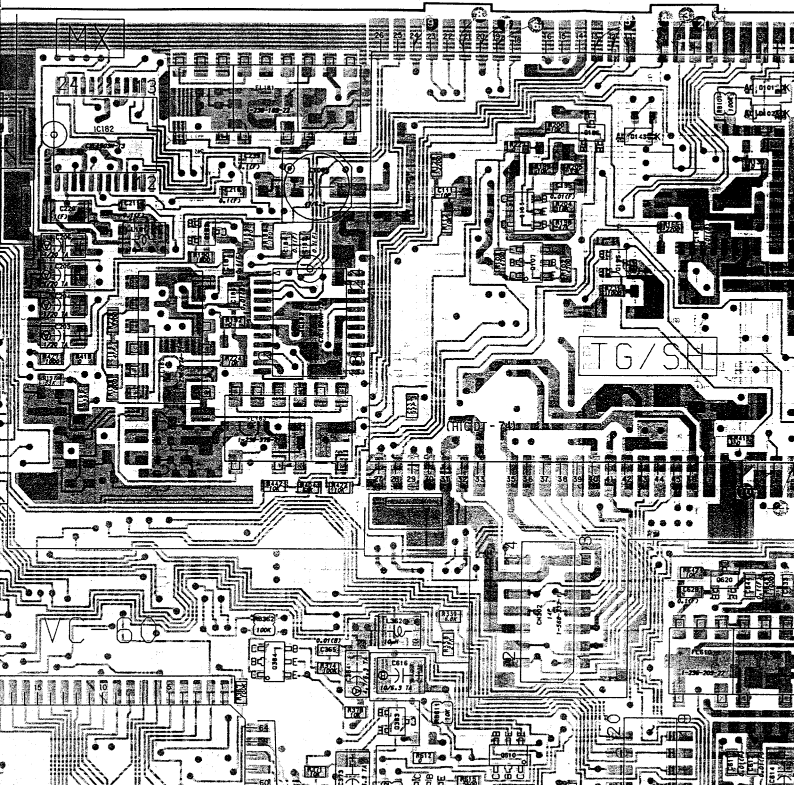
- **For printed wiring boards.**
- VC-60 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

Caution:

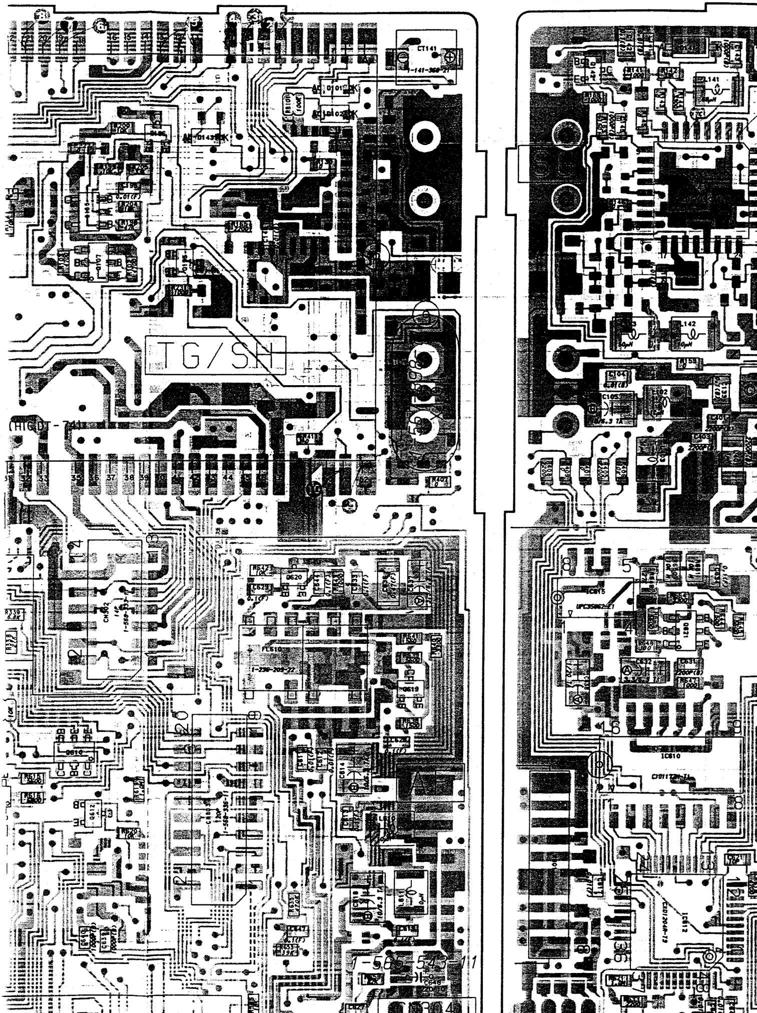
- [illegible] Parts on the [illegible] face side
- [illegible] pattern [illegible] indicated.
- Parts face side: [illegible] side se
- [illegible] side. [illegible]

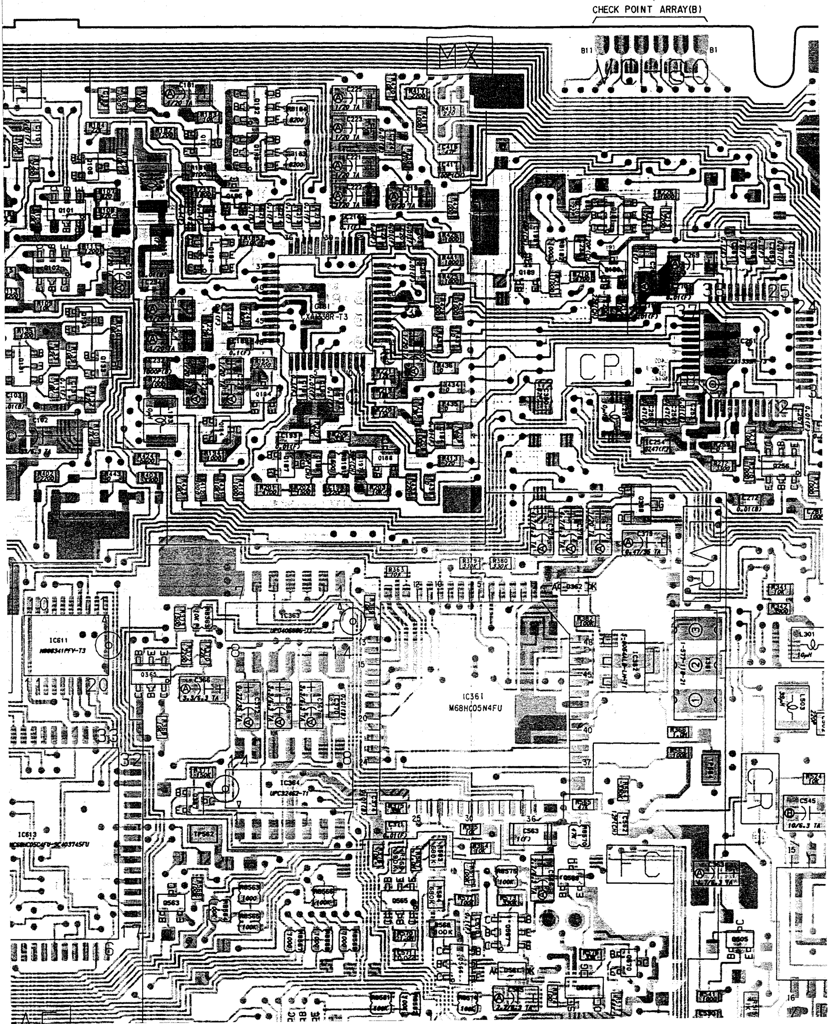
VC-60 BOARD (COMPONENT SIDE)


CHECK POINT ARRAY(A)
A1
A11
A
B
C
D
E
F
G
C318
120/6.3
L302
180μH
C322
C330
470P(B)
Q303
Q304
Q306
Q307
Q309
IC303
UPC31162-E1
IC252
IC302
C252
AU57M
EVR
Q361
Q362
Q363
C337
0.01(B)
C503
C504
C505
C506
C509
C510
C513
Q501
Q503
Q508
19
15


MX
IC182
FL181
TG/SH
(HIGDT-74)
VC-60
CN302
FL185
FL610
Q620
Q810
Q384
Q383
L362
C616
R339
R362

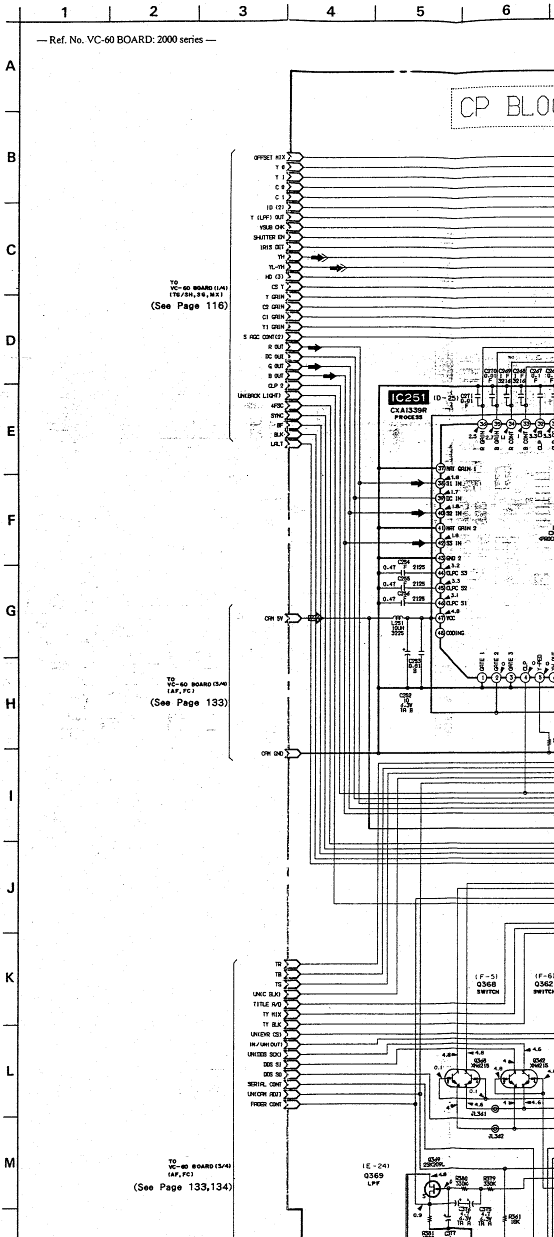
VC-60 BOARD (CONDUCTOR SIDE)

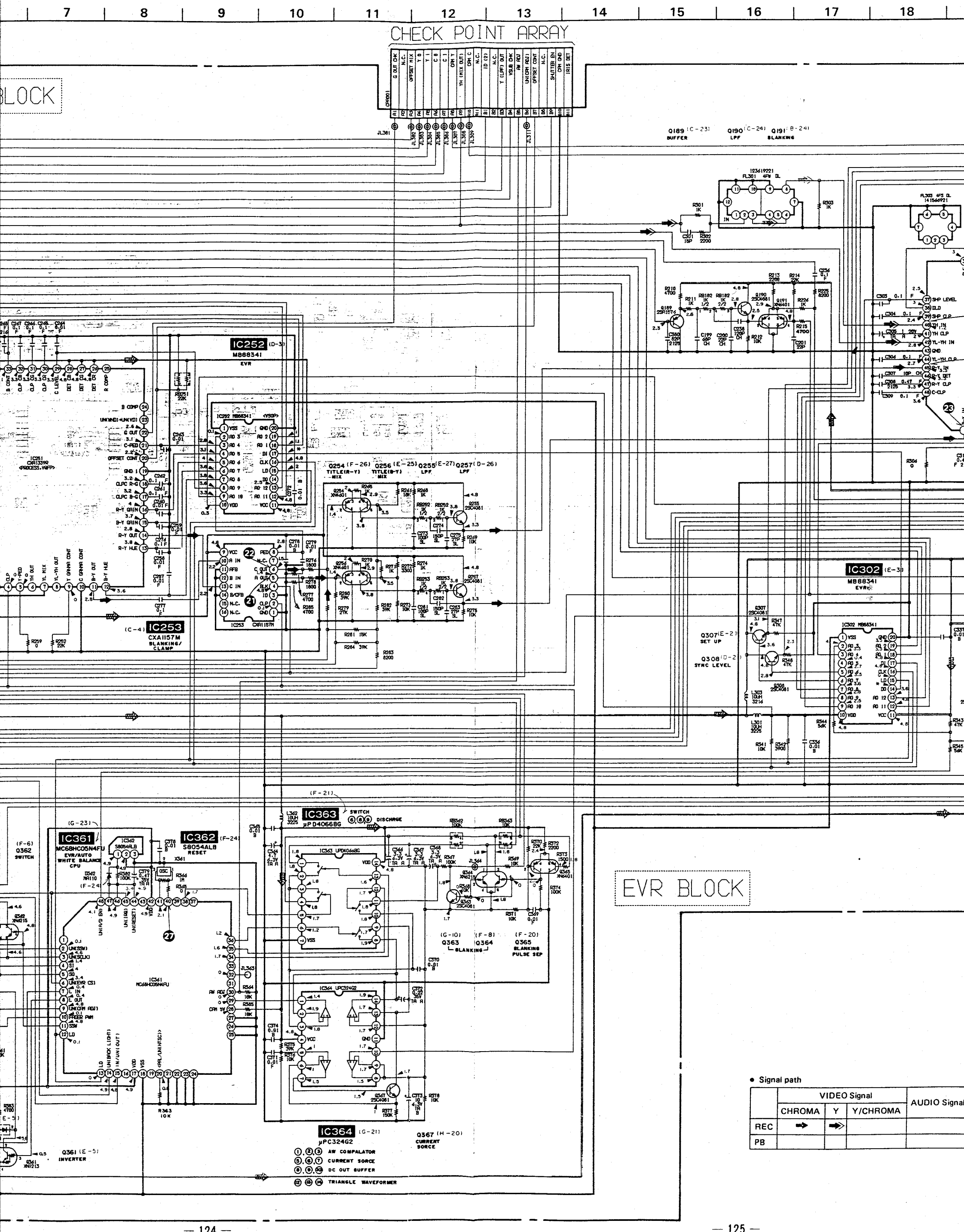

TG/SH
CT141
1-586-543-11
IC610
IC612
IC615
CN302
FL610
Q619
Q620
Q610
Q612
L141
L142
C105
R339


CHECK POINT ARRAY(B)
B11
B1
MX
CP
CXA1338R-T3
IC261
IC361
M68HC05N4FU
IC611
IC613
IC363
IC364
UPC3246Z-T1
Q101
Q102
Q184
Q189
Q256
Q365
Q563
Q565
Q605
TP562
L301
CR
FC

VC-60 (CAMERA) SCHEMATIC DIAGRAMS

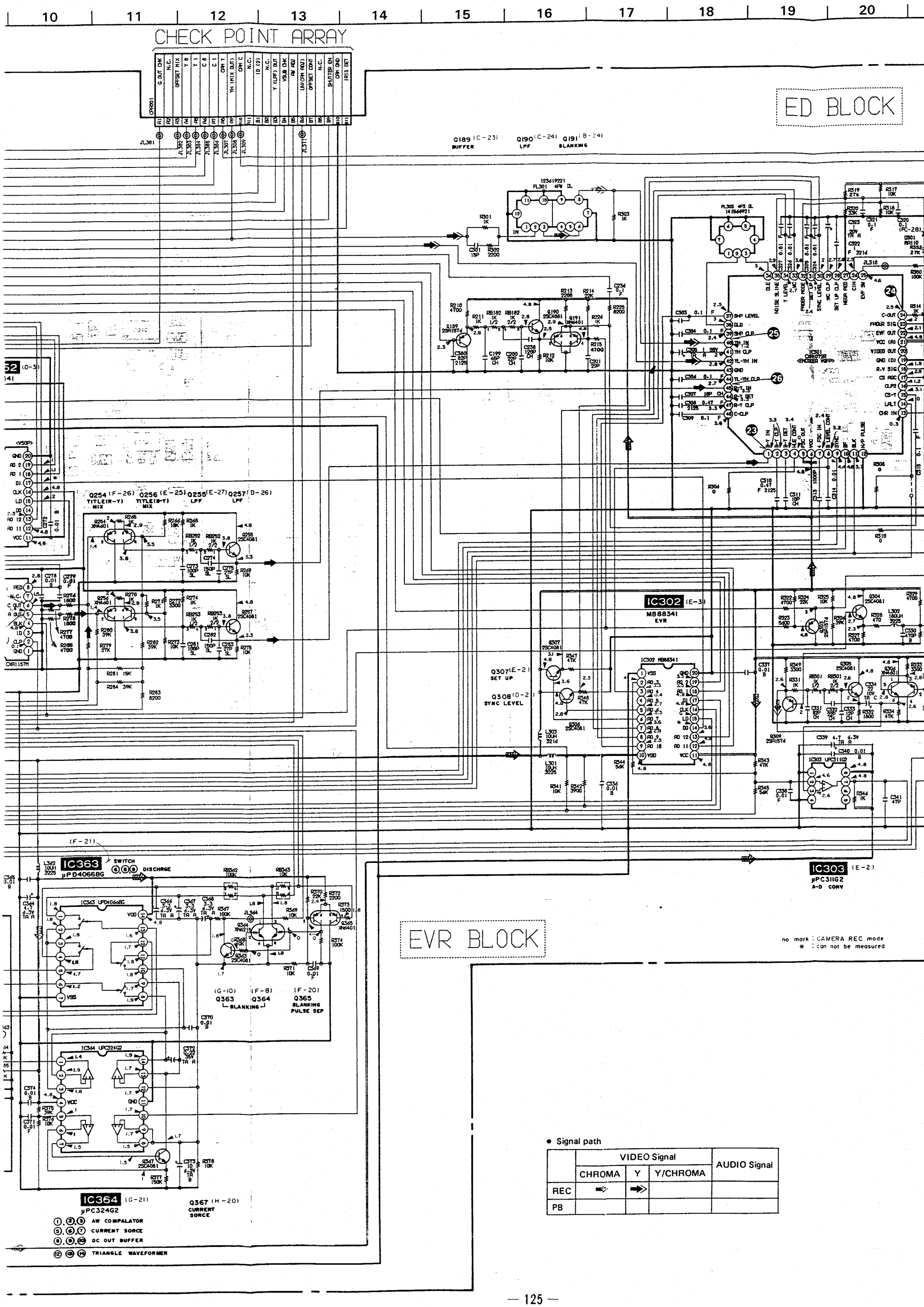
— Ref. No. VC-60 BOARD: 2000 series —


1
2
3
4
5
6
A
B
C
D
E
F
G
H
I
J
K
L
M
CP BLO
OFFSET MIX
Y 0
Y 1
C 0
C 1
ID (2)
Y (LPF) OUT
VSUB CHK
SHUTTER EN
IRIS DET
YH
YL-YH
HD (3)
CS Y
Y GAIN
C2 GAIN
C1 GAIN
Y1 GAIN
S AGC CONT(2)
R OUT
DC OUT
G OUT
B OUT
CLP 2
UN(BACK LIGHT)
4FSC
SYNC
BF
BLK
LALT
TO VC-60 BOARD (1/4) (TG/SH,SG,MX)
(See Page 116)
IC251
(D-25)
CXA1339R
PROCESS
NAT GAIN 1
S1 IN
DC IN
S2 IN
NAT GAIN 2
S3 IN
GND 2
CLPC S3
CLPC S2
CLPC S1
VCC
CODING
C254 0.47 F 2125
C255 0.47 F 2125
C256 0.47 F 2125
L251 10UH 3225
C253 0.01 B
C252 10 6.3V TA B
C270 0.01 F
C269 1 F 3216
C268 1 F 3216
C267 0.1 F
C271 0.01 F
R GAIN
B GAIN
R CONT
B CONT
CLP
GATE 1
GATE 2
GATE 3
Y-PED
CAM 5V
TO VC-60 BOARD (3/4) (AF,FC)
(See Page 133)
CAM GND
TR
TB
TS
UN(C BLK)
TITLE A/D
TY MIX
TY BLK
UN(EVR CS)
IN/UN(OUT)
UN(DDS SCK)
DDS SI
DDS SO
SERIAL CONT
UN(CAM ADJ)
FADER CONT
(F-5)
Q368
SWITCH
(F-6)
Q362
SWITCH
Q368 XN4215
Q362 XN4215
JL361
JL342
TO VC-60 BOARD (3/4) (AF,FC)
(See Page 133,134)
(E-24)
Q369
LPF
Q369 2SK209L
R380 330K
R379 330K
C376 4.7 6.3V TA A
C375 4.7 6.3V TA A
R361 10K
R381
C377


7
8
9
10
11
12
13
14
15
16
17
18
CHECK POINT ARRAY
BLOCK
G OUT CHK
N.C.
OFFSET MIX
Y 0
Y 1
C 0
C 1
CPH Y
YH (MIX OUT)
CPH C
N.C.
ID (2)
C 1
Y (LPF) OUT
VSUB CHK
AW ADJ
UNI(CPH ADJ)
OFFSET CONT
N.C.
SHUTTER EN
CPH GND
IRIS DET
Q189 (C-23) BUFFER
Q190 (C-24) LPF
Q191 (B-24) BLANKING
FL301 4FH DL
FL303 4FS DL
IC252 (D-3) MB88341 EVR
IC253 CXA1157M BLANKING/CLAMP
IC251 CXA1339Q
Q254 (F-26) TITLE(R-Y) MIX
Q256 (E-25) TITLE(B-Y) MIX
Q255 (E-27) LPF
Q257 (D-26) LPF
IC302 (E-3) MB88341 EVR
Q307 (E-2) SET UP
Q308 (D-2) SYNC LEVEL
IC361 MC68HC05N4FU EVR/AUTO WHITE BALANCE CPU
IC362 (F-24) S8054ALB RESET
IC363 μPD4066BG
IC363 SWITCH ⑥⑧⑨ DISCHARGE
Q362 (F-6) SWITCH
Q363 (G-10) BLANKING
Q364 (F-8) BLANKING
Q365 (F-20) BLANKING PULSE SEP
EVR BLOCK
IC364 (G-21) μPC324G2
①②③ AW COMPALATOR
⑤⑥⑦ CURRENT SORCE
⑧⑨⑩ DC OUT BUFFER
⑫⑬⑭ TRIANGLE WAVEFORMER
Q367 (H-20) CURRENT SORCE
Q361 (E-5) INVERTER

• Signal path

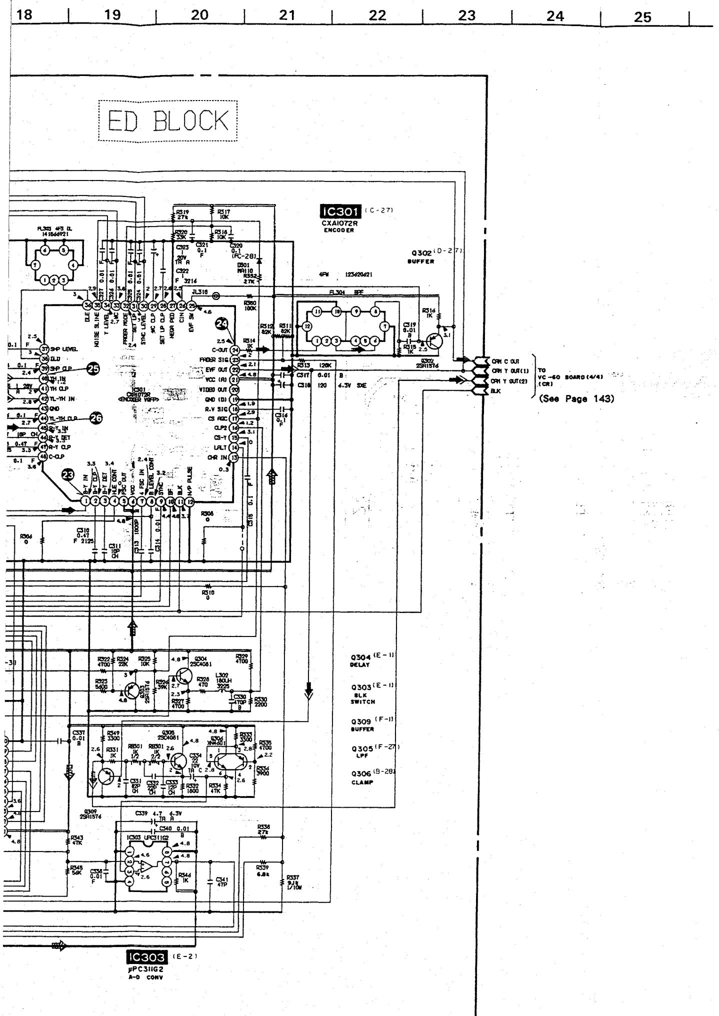
	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC	➡	⇨		
PB				


10
11
12
13
14
15
16
17
18
19
20
CHECK POINT ARRAY
CP001
G OUT CHK
N.C.
OFFSET MIX
Y B
Y 1
C B
C 1
CAM Y
YH (MIX OUT)
CAM C
N.C.
ID (2)
N.C.
Y (LPF) OUT
VSUB CHK
AW ADJ
LIN(CAM ADJ)
OFFSET CONT
N.C.
SHUTTER EN
CAM GND
IRIS DET
JL301
JL311
ED BLOCK
Q189 (C-23) BUFFER
Q190 (C-24) LPF
Q191 (B-24) BLANKING
FL301 4FH DL
FL303 4FS DL
IC301 CXA1072R (ENCODER W.F.P.)
IC302 (E-3)
MB88341
EVR
IC302 MB88341
Q307 (E-2) SET UP
Q308 (D-2) SYNC LEVEL
IC303 (E-2)
μPC311G2
A-D CONV
Q254 (F-26) TITLE(R-Y) MIX
Q256 (E-25) TITLE(B-Y) MIX
Q255 (E-27) LPF
Q257 (D-26) LPF
CXA1157M
IC363 μPD4066BG
SWITCH
⑥⑧⑨ DISCHRGE
IC363 UPD4066BG
(G-10) Q363
(F-8) Q364
BLANKING
(F-20) Q365
BLANKING PULSE SEP
EVR BLOCK
IC364 (G-21)
μPC324G2
IC364 UPC324G2
Q367 (H-20) CURRENT SORCE
①,②,③ AW COMPALATOR
⑤,⑥,⑦ CURRENT SORCE
⑧,⑨,⑩ DC OUT BUFFER
⑫ ⑬ ⑭ TRIANGLE WAVEFORMER

no mark : CAMERA REC mode
* : can not be measured

- Signal path

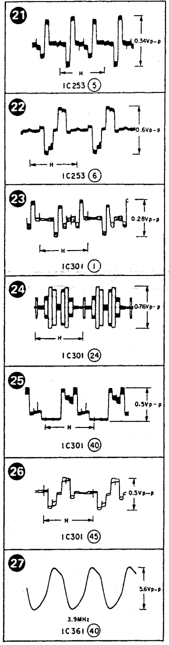
	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC	⇨	➡		
PB				


18
19
20
21
22
23
24
25
ED BLOCK
IC301 (C-27)
CXA1072R
ENCODER
Q302 (D-27)
BUFFER
FL304 BPF
CAM C OUT
CAM Y OUT(1)
CAM Y OUT(2)
BLK
TO VC-60 BOARD (4/4) (CN)
(See Page 143)
Q304 (E-11) DELAY
Q303 (E-11) BLK SWITCH
Q309 (F-11) BUFFER
Q305 (F-27) LPF
Q306 (B-28) CLAMP
IC303 (E-2)
μPC3112
A-D CONV
SHP LEVEL
SHP CLP
TH CLP
YL-TH CLP
R-Y CLP
C-CLP
C-OUT
FADER SIG
EVF OUT
VIDEO OUT
R-Y SIG
CS AGC
CLP2
CHR IN
IC301 CXA1072R ENCODER Y&FP
IC303 UPC3112

VC-60 BOARD (2/4)
(CP,ED,EVR)

no mark : CAMERA REC mode
✳ : can not be measured

VC-60 BOARD (CP,ED,EVR)



MA	AUDIO Signal

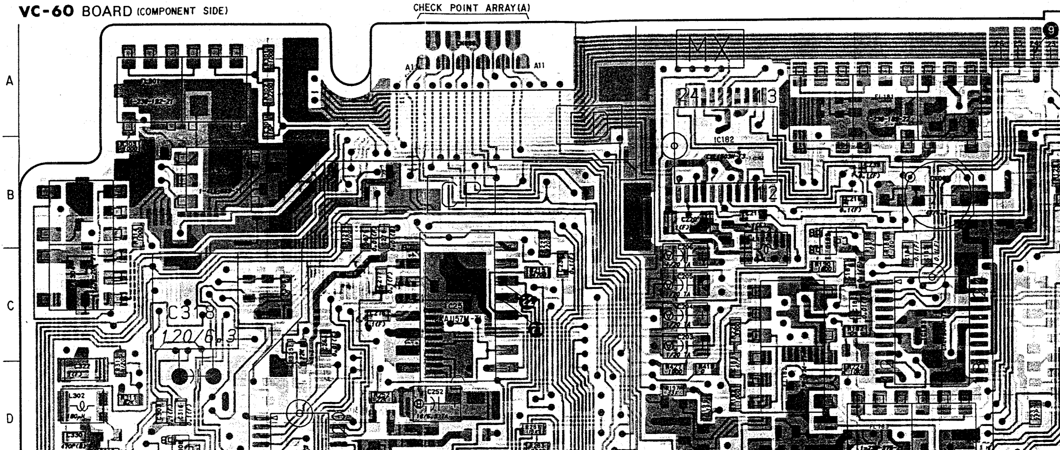
VC-60 (CAMERA) PRINTED WIRING BOARDS

— Ref. No. VC-60 BOARD: 2000 series —

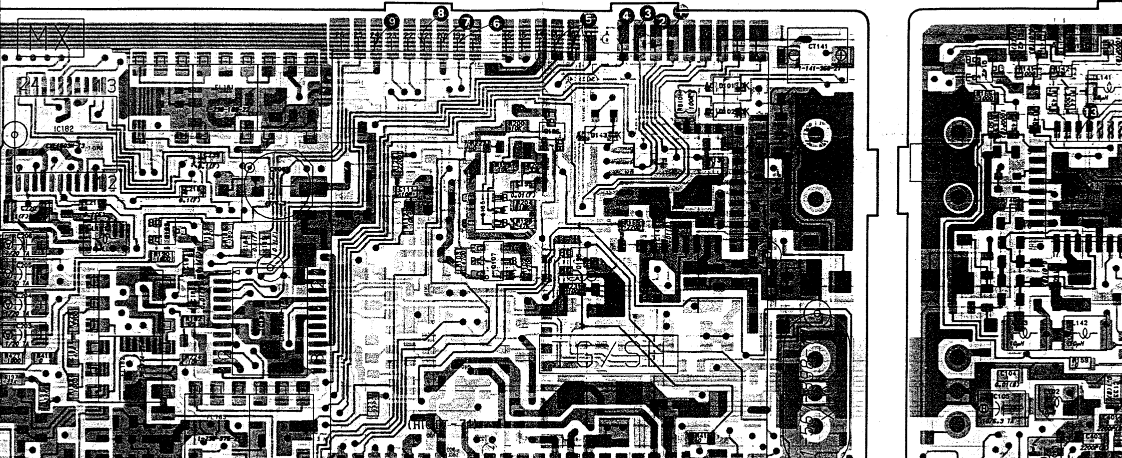
- **For printed wiring boards.**
- VC-60 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

Caution:	
Pattern face side (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side (Component side)	Parts on the parts face side seen from the pattern face are indicated.

VC-60 BOARD (COMPONENT SIDE)

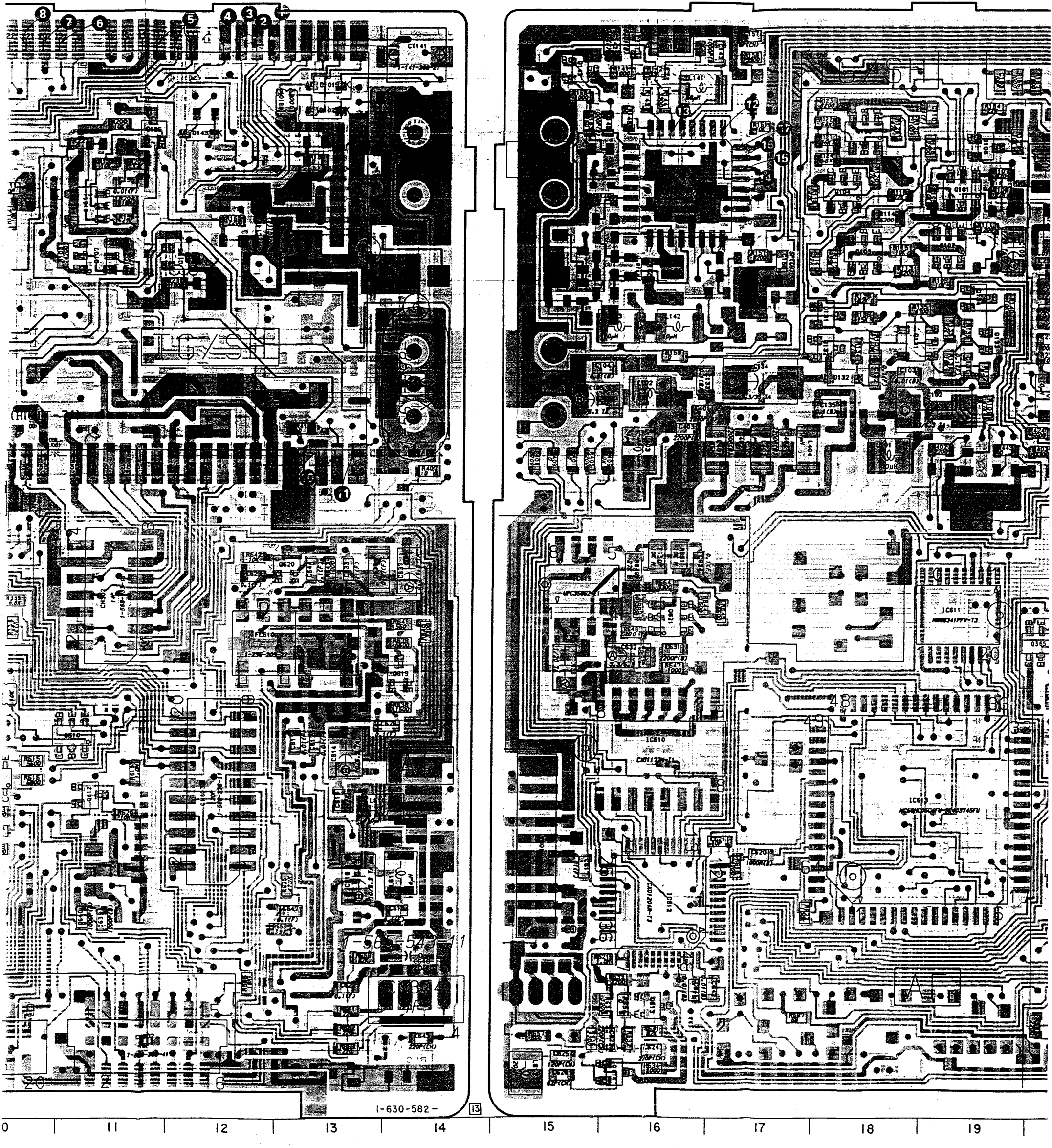

CHECK POINT ARRAY(A)
A
B
C
D
A1
A11
9
MX
24
13
12
IC182
FL181
C318
120/6.3
C252
C206
C205
C204
C203
L302
80μH
L322
L330
FL183

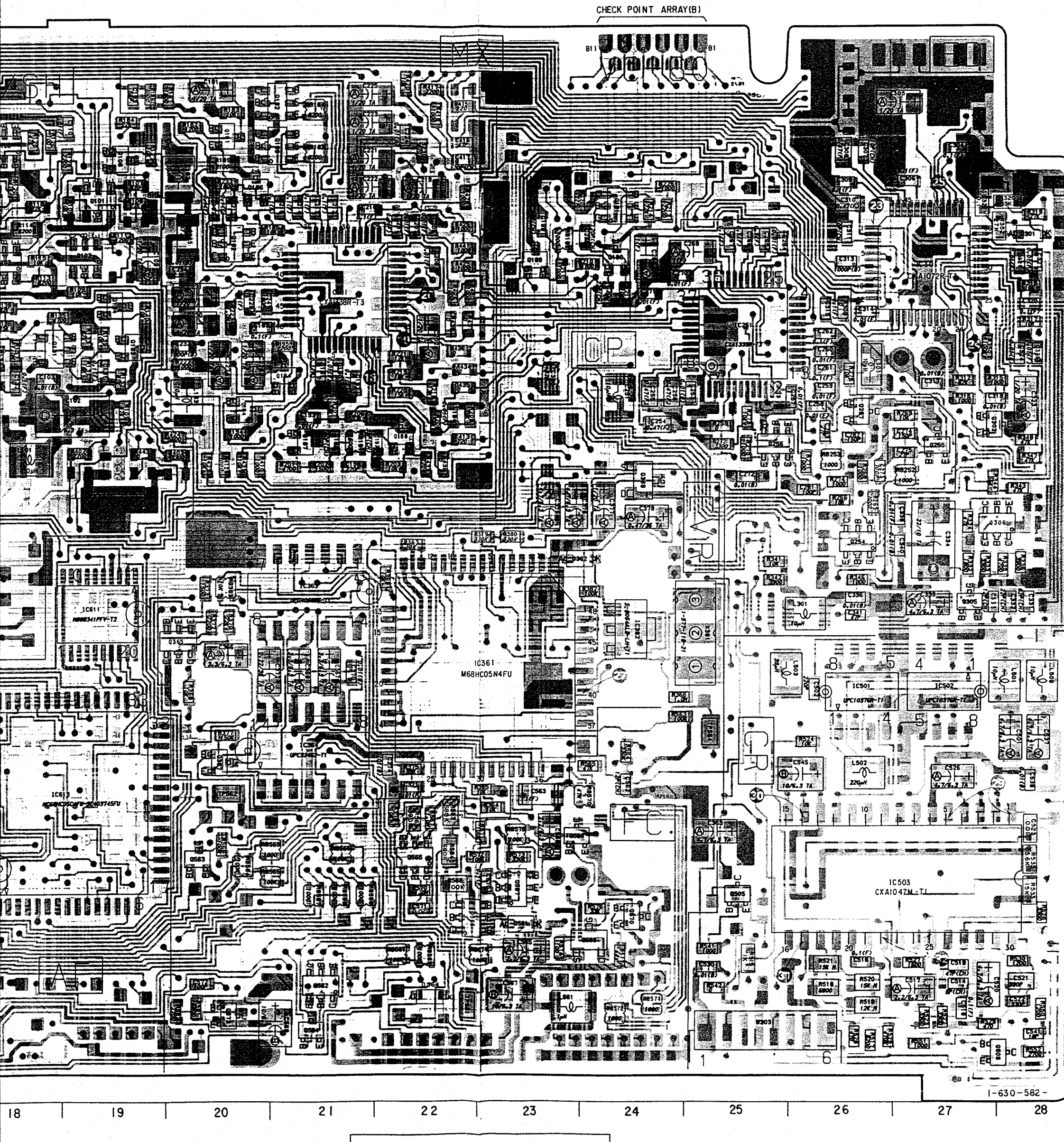
VC-60 BOARD (CONDUCTOR SIDE)



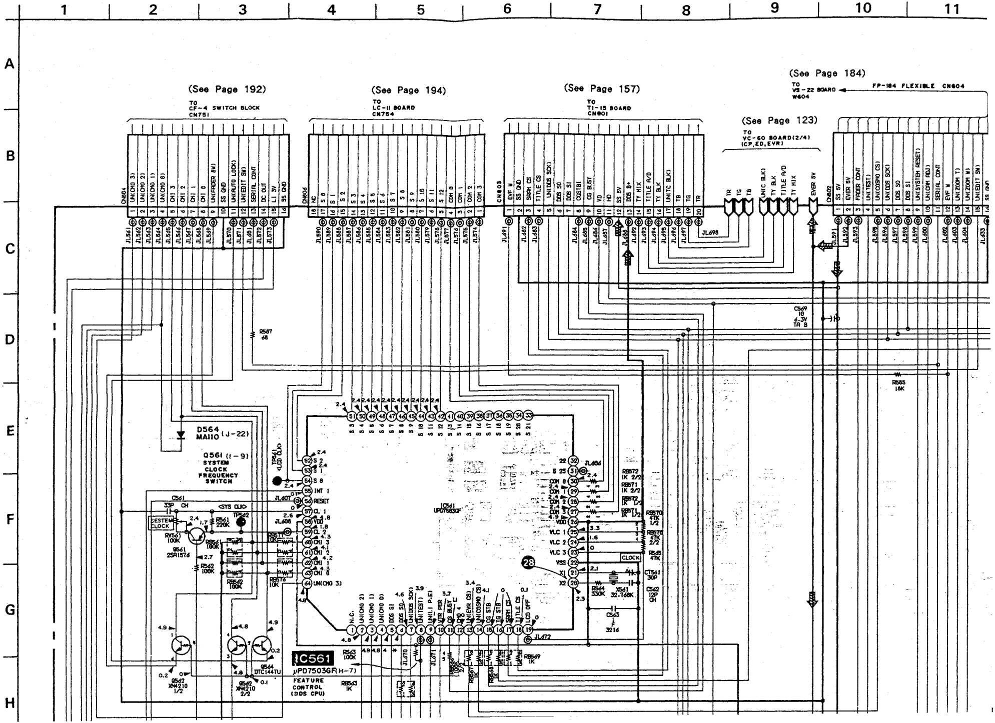
MX
24
13
12
IC182
FL181
CT141
L141
L142
C104
C105
R159
IG/SH
①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑬

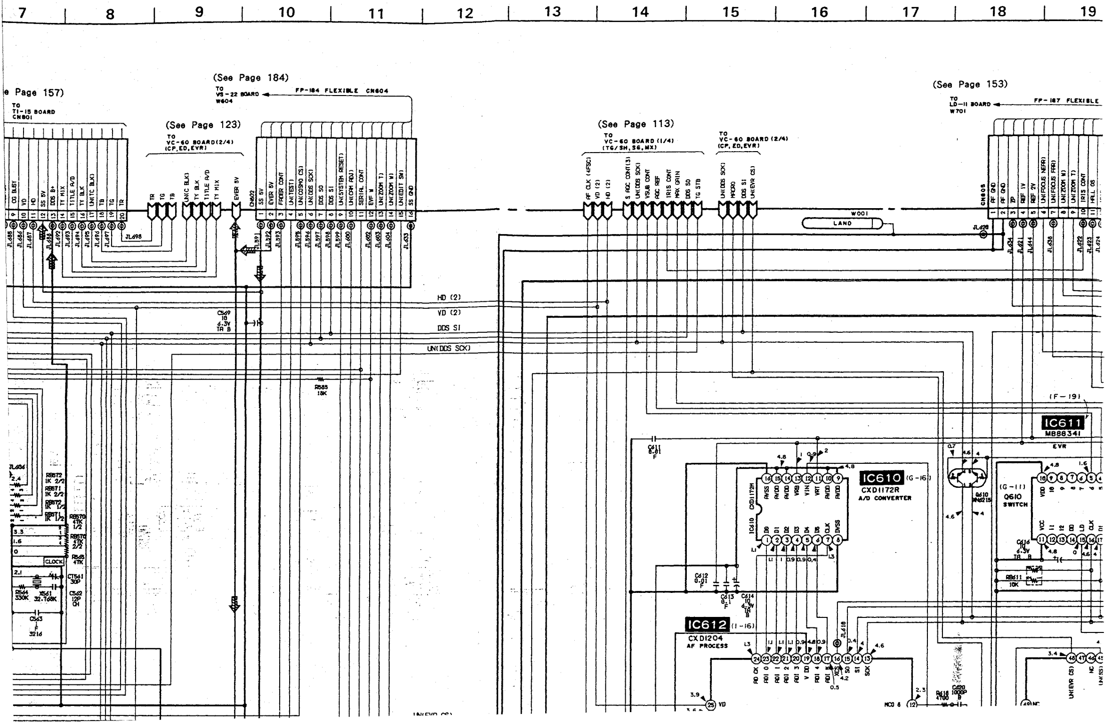
VC-60 BOARD (CONDUCTOR SIDE)

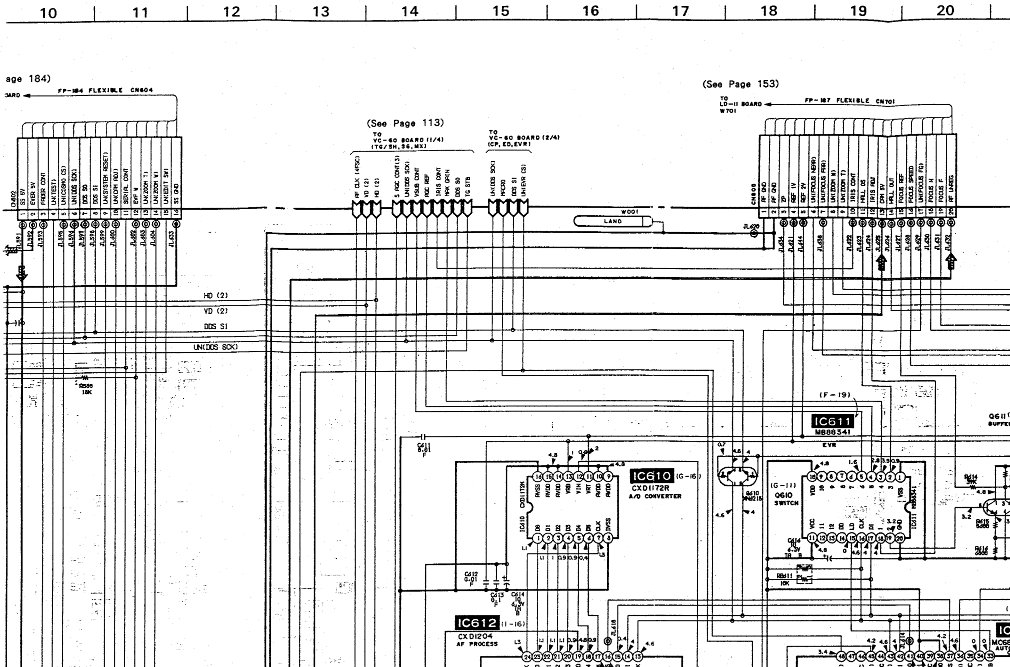

1-630-582-
13
0
11
12
13
14
15
16
17
18
19


CHECK POINT ARRAY(B)
B11
B1
IC361
M68HC05N4FU
IC503
CXA1047M-T1
IC501
UPC1037GR-T1
IC502
IC611
IC613
1-630-582-
18
19
20
21
22
23
24
25
26
27
28

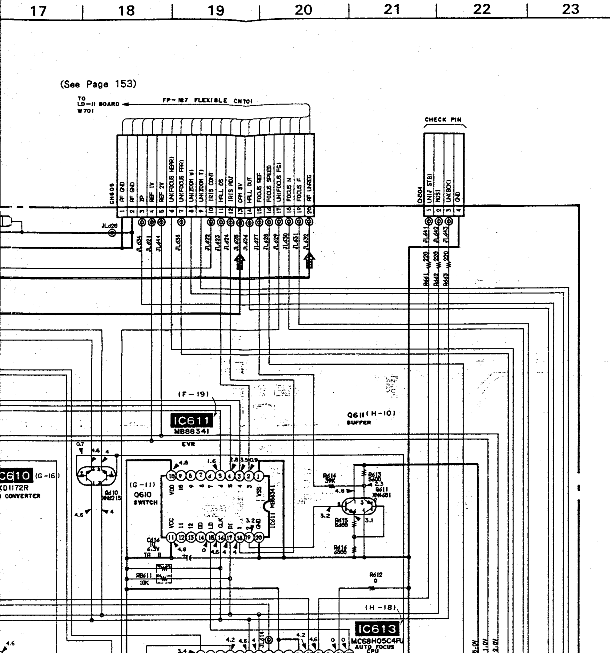
VC-60 (CAMERA) SCHEMATIC DIAGRAMS


(See Page 192)
TO CF-4 SWITCH BLOCK CN751
(See Page 194)
TO LC-11 BOARD CN754
(See Page 157)
TO TI-15 BOARD CN801
(See Page 123)
TO VC-60 BOARD(2/4) (CP,ED,EVR)
(See Page 184)
TO VS-22 BOARD W604
FP-184 FLEXIBLE CN604
CN804
CN806
CN803
CN802
D564 MA110 (J-22)
Q561 (I-9) SYSTEM CLOCK FREQUENCY SWITCH
Q561 2SA1576
Q562 XN4210 1/2
Q562 XN4210 2/2
Q564 DTC144TU
RV561 100K
SYSTEM CLOCK
C561 33P CH
R561 220K
R562 100K
R567 68
TP561 (LCD CLK)
TP562
R585 18K
C569 10 6.3V TA B
IC561
µPD7503GF(H-7)
FEATURE CONTROL (DDS CPU)
IC541 UPD7503GF
X561 32.768K
R564 330K
CT561 30P
C562 12P CH
C563 3216
R563 100K
RB563 1K
RB549 1K
CLOCK
28

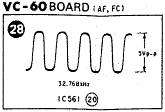

7
8
9
10
11
12
13
14
15
16
17
18
19
(See Page 157)
TO TI-15 BOARD CN801
(See Page 184)
TO VS-22 BOARD W604
FP-184 FLEXIBLE CN604
(See Page 123)
TO VC-60 BOARD(2/4) (CP,ED,EVR)
(See Page 113)
TO VC-60 BOARD (1/4) (TG/SH,SG,MX)
TO VC-60 BOARD (2/4) (CP,ED,EVR)
(See Page 153)
TO LD-11 BOARD W701
FP-187 FLEXIBLE
CG BLGY
VD
HD
SS 5V
DDS B+
TY MIX
TITLE A/D
TY BLK
UN(TC BLK)
TB
TG
TR
UN(C BLK)
EVER 5V
CN602
FADER CONT
UN(TEST)
UN(COSMO CS)
UN(DDS SCK)
DDS SO
DDS SI
UN(SYSTEM RESET)
UN(CAM ADJ)
SERIAL CONT
EVF W
UN(ZOOM T)
UN(ZOOM W)
UN(EDIT SW)
SS GND
AF CLK (4FSC)
VD (2)
HD (2)
S AGC CONT(3)
VSUB CONT
AGC REF
IRIS CONT
MAX GAIN
TG STB
MACRO
UN(EVR CS)
W001
LAND
CN808
AF GND
ZP
REF 1V
REF 2V
UN(FOCUS NEAR)
UN(FOCUS FAR)
UN(ZOOM W)
UN(ZOOM T)
HALL OS
JL698
JL591
C569 10 6.3V TA B
HD (2)
VD (2)
DDS SI
UN(DDS SCK)
R585 18K
(F-19)
IC611
MB88341
EVR
C611 0.01 F
IC610
(G-16)
CXD1172R
A/D CONVERTER
AVSS
AVDD
VRB
VIN
VRT
CLK
DVSS
C612 0.01 F
C613 0.1 F
C614 10 6.3V TA B
Q610 XN4215
(G-11)
Q610 SWITCH
C616 10 6.3V TA B
R8611 10K
IC612
(1-16)
CXD1204
AF PROCESS
AD CK
V DD
XCS
SO
SI
SCK
VD
MCO 8
R618 4700
C620 1000P B
UN(EVR CS)
NC
UN(SS1)
R8572 1K 2/2
R8571 1K 2/2
R8570 4.7K 1/2
R565 47K
CLOCK
CT561 30P
C562 12P CH
R564 330K
X561 32.768K
C563 F 3216
JL604
JL618
JL626
UN(EVR CS)


10
11
12
13
14
15
16
17
18
19
20
age 184)
FP-184 FLEXIBLE CN604
ARD
CN602
SS 5V
EVER 5V
FADER CONT
UN(TEST)
UN(COSMO CS)
UN(DDS SCK)
DDS SO
DDS SI
UN(SYSTEM RESET)
UN(CAM ADJ)
SERIAL CONT
EVF W
UN(ZOOM T)
UN(ZOOM W)
UN(EDIT SW)
SS GND
JL591
JL592
JL593
JL595
JL596
JL597
JL598
JL599
JL600
JL602
JL603
JL604
JL633
R585
18K
HD (2)
VD (2)
DDS SI
UN(DDS SCK)
(See Page 113)
TO
VC-60 BOARD (1/4)
(TG/SH, SG, MX)
AF CLK (4FSC)
VD (2)
HD (2)
S AGC CONT(3)
UN(DDS SCK)
VSUB CONT
AGC REF
IRIS CONT
MAX GAIN
DDS SO
TG STB
TO
VC-60 BOARD (2/4)
(CP, ED, EVR)
UN(DDS SCK)
MACRO
DDS SI
UN(EVR CS)
W001
LAND
(See Page 153)
TO
LD-11 BOARD
W701
FP-187 FLEXIBLE CN701
CN805
AF GND
AF GND
ZP
REF 1V
REF 2V
UN(FOCUS NEAR)
UN(FOCUS FAR)
UN(ZOOM W)
UN(ZOOM T)
IRIS CONT
HALL OS
IRIS ADJ
CAM 5V
HALL OUT
FOCUS REF
FOCUS SPEED
UN(FOCUS FG)
FOCUS N
FOCUS F
AF UNREG
JL620
JL634
JL621
JL644
JL638
JL622
JL623
JL624
JL625
JL626
JL627
JL628
JL629
JL630
JL631
JL632
C611
0.01
F
IC610 (G-16)
CXD1172R
A/D CONVERTER
AVSS
AVDD
VRB
VIN
VRT
D0
D1
D2
D3
D4
D5
CLK
DVSS
C612
0.01
F
C613
0.1
F
C614
10
6.3V
TA
B
IC612 (I-16)
CXD1204
AF PROCESS
JL618
(F-19)
IC611
MB88341
EVR
Q610
MN6215
(G-11)
Q610
SWITCH
VDD
VCC
LD
CLK
DI
VSS
GND
C616
10
6.3V
TA B
RB611
10K
R614
39K
R615
5600
R616
5600
Q611
BUFFER
JL614
MC68
AUTO

(See Page 153)


17
18
19
20
21
22
23
24
25
TO
LD-II BOARD
W701
FP-187 FLEXIBLE CN701
CN805
AF GND
AF GND
ZP
REF 1V
REF 2V
UN(FOCUS NEAR)
UN(FOCUS FAR)
UN(ZOOM W)
UN(ZOOM T)
IRIS CONT
HALL OS
IRIS ADJ
CAM 5V
HALL OUT
FOCUS REF
FOCUS SPEED
UN(FOCUS FG)
FOCUS N
FOCUS F
AF UNREG
JL626
JL634
JL621
JL644
JL638
JL622
JL623
JL624
JL625
JL624
JL627
JL628
JL629
JL630
JL631
JL632
CHECK PIN
CN504
UN(J STB)
MOSI
UN(SCK)
GND
JL641
JL642
JL643
R661 220
R662 220
R663 220
(F-19)
IC611
MB88341
EVR
VDD
VSS
VCC
LD
CLK
DI
GND
IC610 (G-16)
XD1172R
CONVERTER
(G-11)
Q610
SWITCH
Q610
XN6215
C616
10
6.3V
TA B
RB611
10K
Q611 (H-10)
BUFFER
R614
39K
R613
5600
Q611
XN4681
R615
5600
R616
6800
R612
0
(H-18)
IC613
MC68HO5C4FU
AUTO FOCUS
CPU
JL614
5.0V
1.0V
2.0V

VC-60 BOARD (AF, FC)



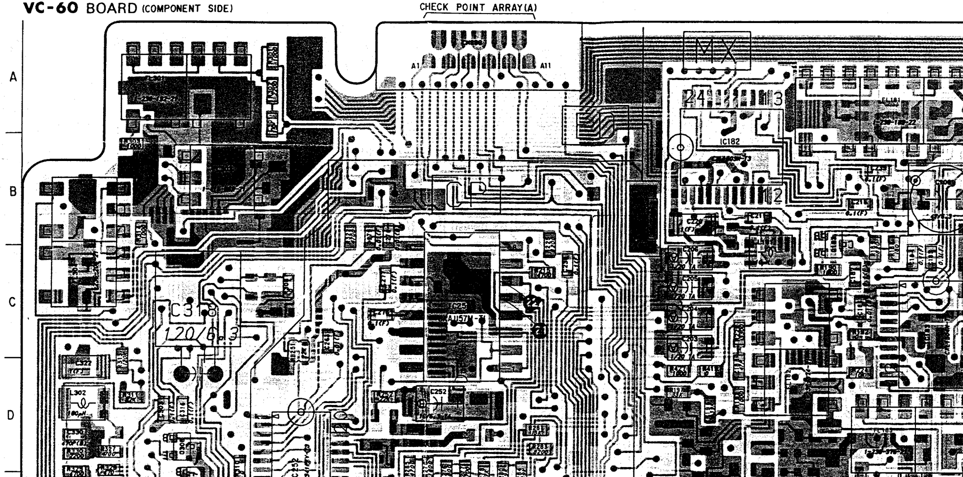
VC-60 (CAMERA) PRINTED WIRING BOARDS

— Ref. No. VC-60 BOARD: 2000 series —

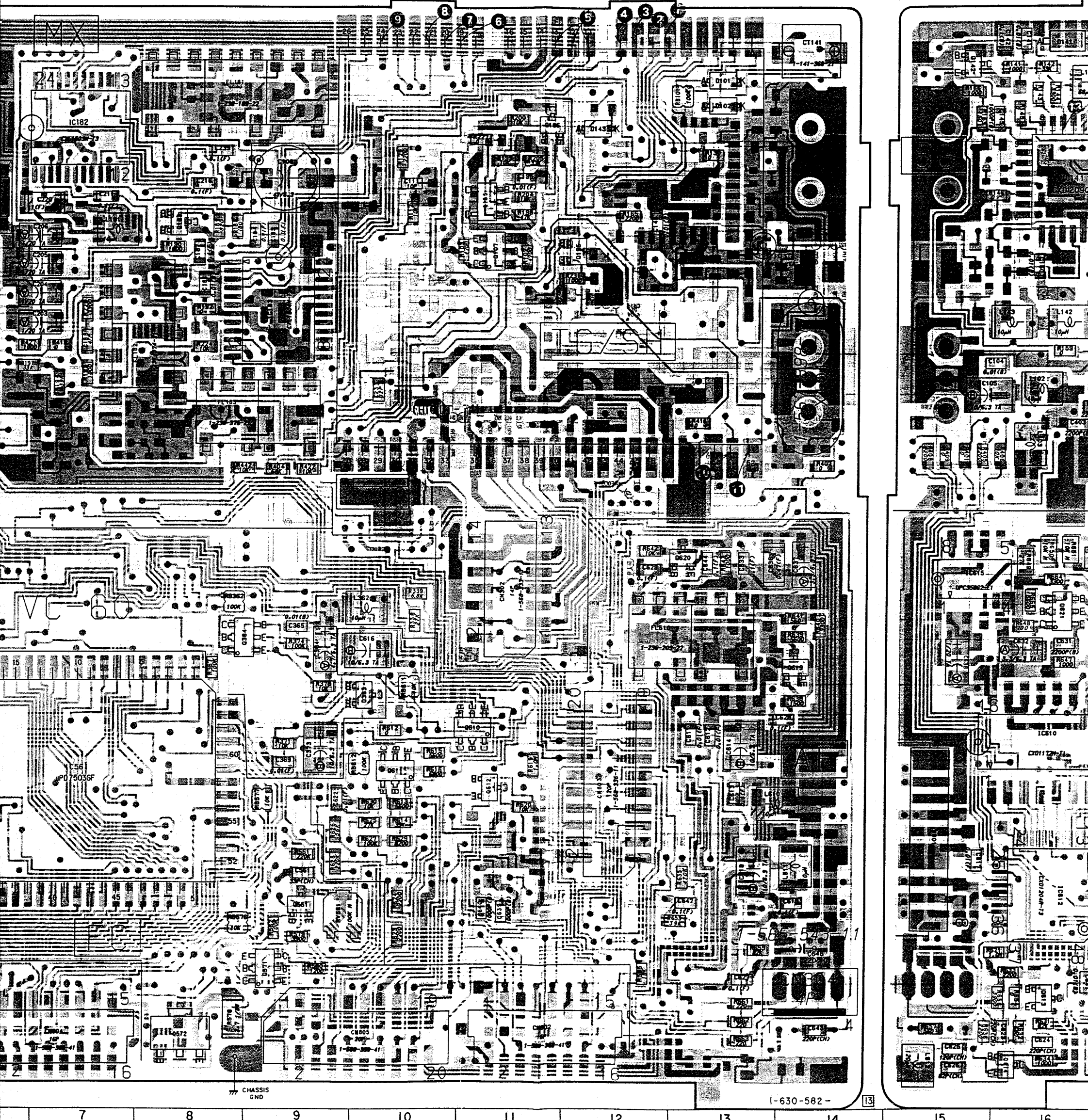
- **For printed wiring boards.**
- VC-60 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.

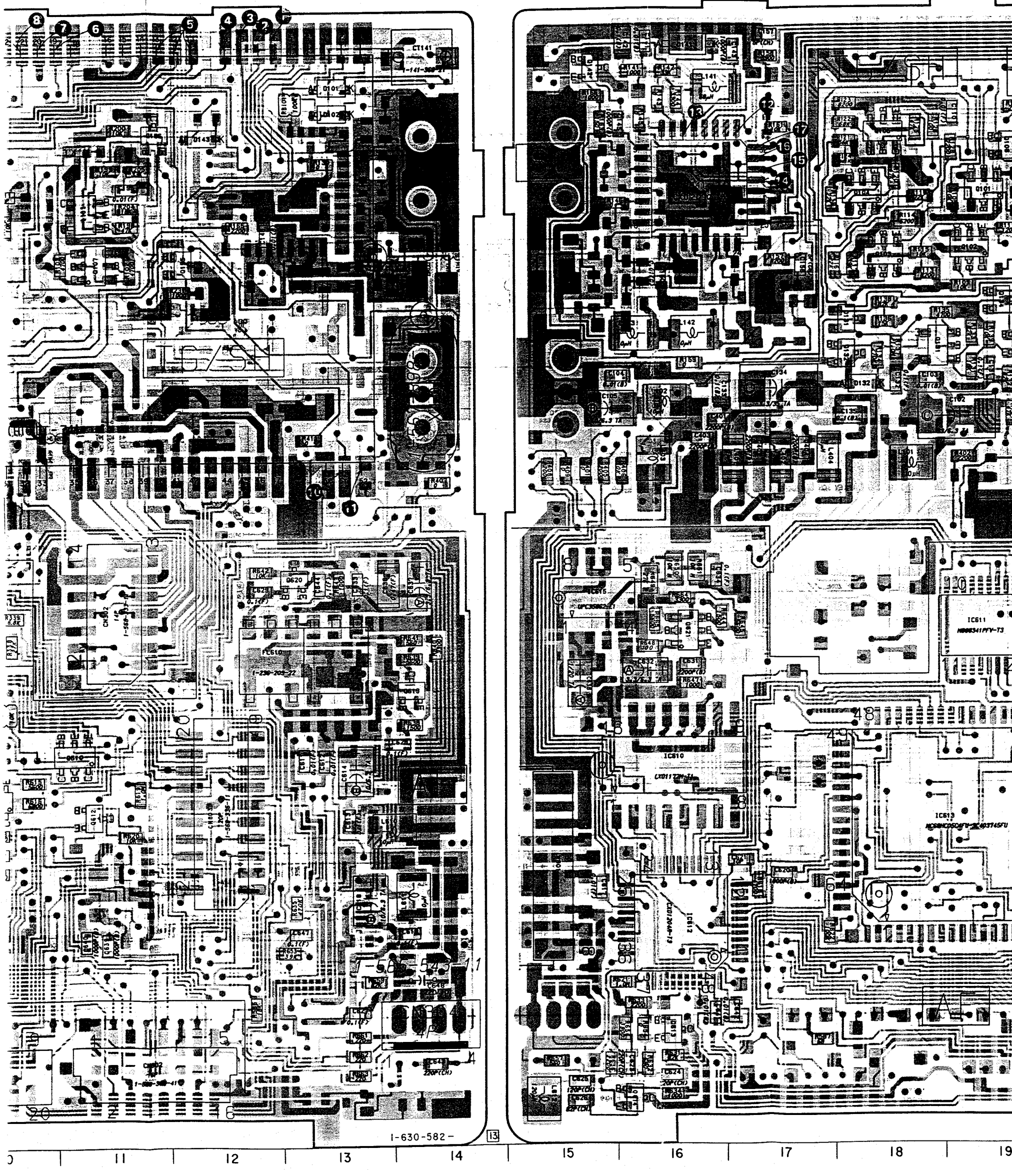
VC-60 BOARD (COMPONENT SIDE)


CHECK POINT ARRAY(A)
A1
A11
A
B
C
D
MX
24
13
12
IC182
C318
120/6.3
L302
180μH
C322
C252
EL181
IC182
A1157M-7
C25

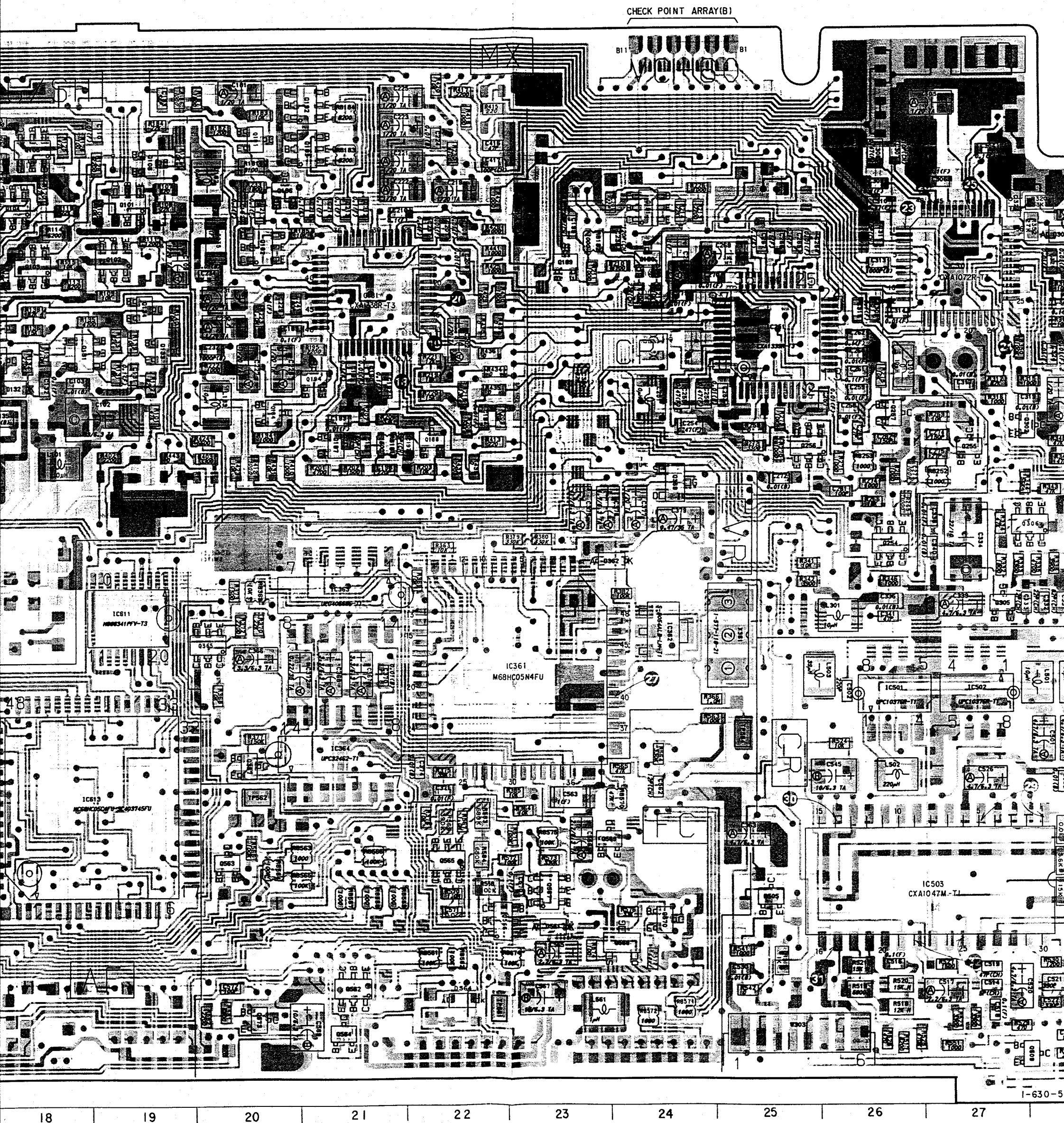
VC-60 BOARD (CONDUCTOR SIDE)


MX
IC182
FL181
CT141
FG/SH
VC-60
IC561
µPD7503GF
IC610
CN805
CN802
CHASSIS GND
1-630-582-
13
7
8
9
10
11
12
13
14
15
16

VC-60 BOARD (CONDUCTOR SIDE)

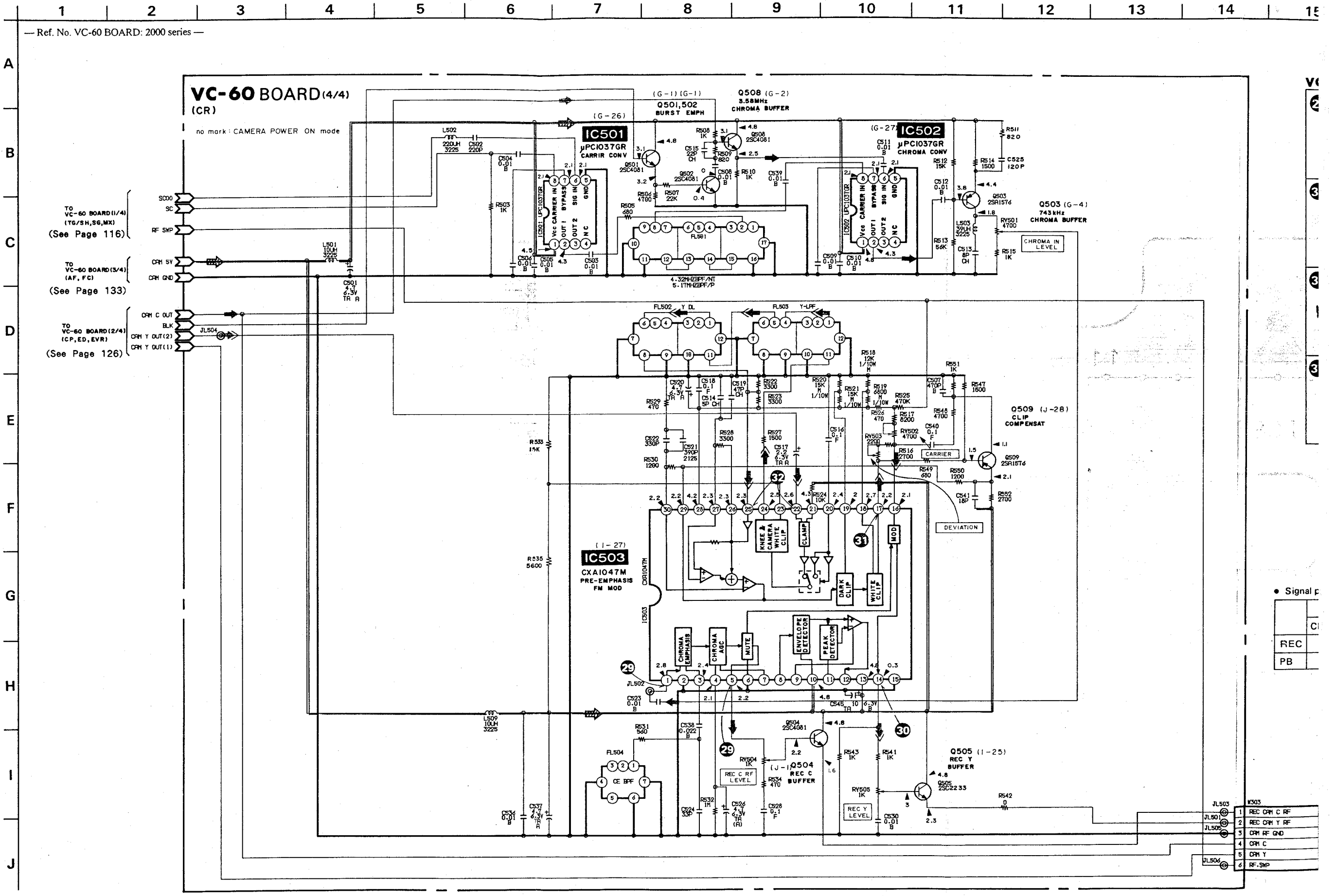

IC611
IC610
IC613
IC612
CN302
FL610
CT141
1-630-582-
13
10
11
12
13
14
15
16
17
18
19

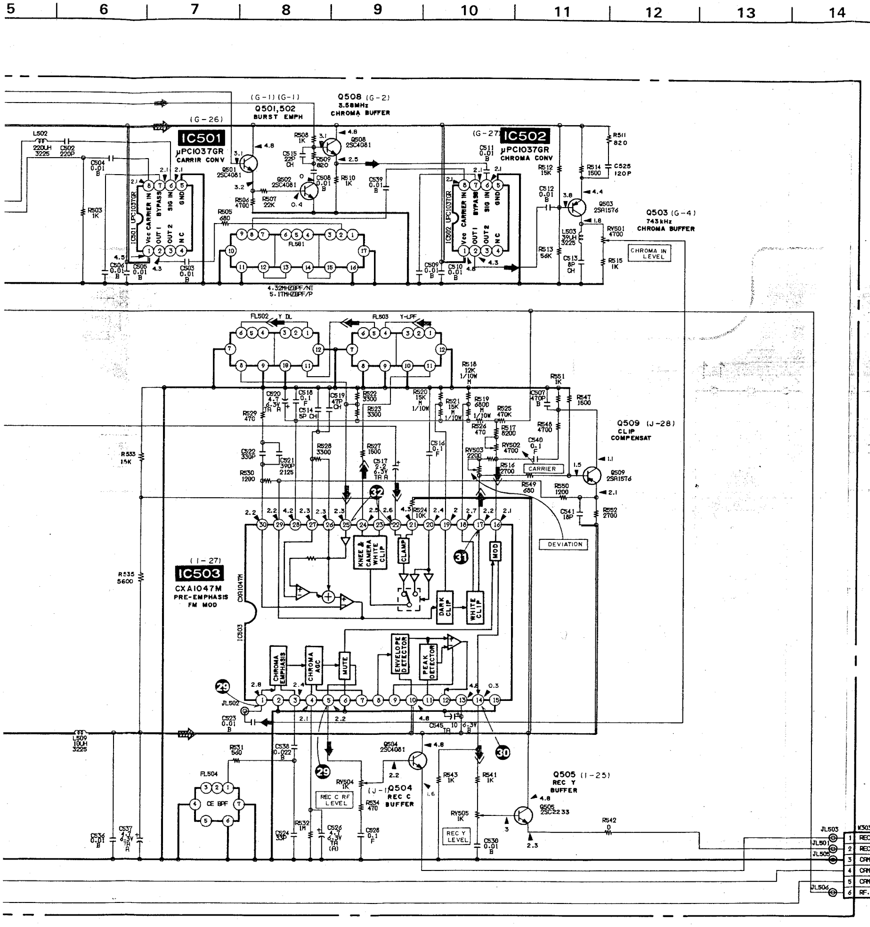
CAMERA **CAMERA**


CHECK POINT ARRAY(B)
B11
B1
IC611
M608341FV-T3
IC361
M68HC05N4FU
IC364
UPC32462-T1
IC613
IC501
UPC1037GR-T1
IC502
IC503
CXA1047M-T1
CXA1072R-T1
18
19
20
21
22
23
24
25
26
27
1-630-5

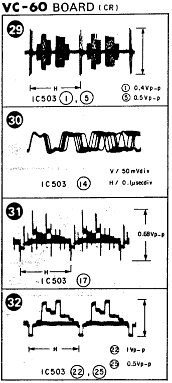
CAMERA **CAMERA**

— Ref. No. VC-60 BOARD: 2000 series —


1
2
3
4
5
6
7
8
9
10
11
12
13
14
A
B
C
D
E
F
G
H
I
J
VC-60 BOARD(4/4)
(CR)
no mark : CAMERA POWER ON mode
TO VC-60 BOARD(1/4) (TG/SH,SG,MX)
(See Page 116)
TO VC-60 BOARD(3/4) (AF, FC)
(See Page 133)
TO VC-60 BOARD(2/4) (CP,ED,EVR)
(See Page 126)
SC00
SC
RF SWP
CAM 5V
CAM GND
CAM C OUT
BLK
CAM Y OUT(2)
CAM Y OUT(1)
JL504
L501 10UH 3225
C501 4.7 6.3V TA A
L502 220UH 3225
C502 220P
IC501
μPC1037GR
CARRIR CONV
Vcc
CARRIER IN
BYPASS
SIG IN
GND
OUT 1
OUT 2
N C
Q501,502
BURST EMPH
Q501 2SC4081
Q502 2SC4081
Q508 (G-2)
3.58MHz
CHROMA BUFFER
Q508 2SC4081
FL501
4.32MHzBPF/NT
5.17MHzBPF/P
IC502
μPC1037GR
CHROMA CONV
Q503 (G-4)
743kHz
CHROMA BUFFER
Q503 2SA1576
L503 39UH 3225
RV501 4700
CHROMA IN LEVEL
FL502 Y DL
FL503 Y-LPF
Q509 (J-28)
CLIP COMPENSAT
Q509 2SA1576
RV502 4700
RV503 2200
CARRIER
DEVIATION
IC503
CXA1047M
PRE-EMPHASIS
FM MOD
KNEE & CAMERA WHITE CLIP
CLAMP
DARK CLIP
WHITE CLIP
MOD
CHROMA EMPHASIS
CHROMA AGC
MUTE
ENVELOPE DETECTOR
PEAK DETECTOR
R533 15K
R535 5600
L509 10UH 3225
JL502
FL504
CE BPF
Q504 (J-1)
REC C BUFFER
Q504 2SC4081
RV504 1K
REC C RF LEVEL
Q505 (I-25)
REC Y BUFFER
Q505 2SC2233
RV505 1K
REC Y LEVEL
R542 0
JL503
JL501
JL505
JL506
K303
1 REC CAM C RF
2 REC CAM Y RF
3 CAM RF GND
4 CAM C
5 CAM Y
6 RF.SWP
㉙
㉚
㉛
㉜
VC
Signal p
REC
PB


5
6
7
8
9
10
11
12
13
14
15
16
17
18
IC501
μPC1037GR
CARRIR CONV
(G-26)
Q501,502
BURST EMPH
(G-1) (G-1)
Q508 (G-2)
3.58MHz
CHROMA BUFFER
IC502
μPC1037GR
CHROMA CONV
(G-27)
Q503 (G-4)
743kHz
CHROMA BUFFER
CHROMA IN LEVEL
FL501
4.32MHzBPF/NT
5.17MHzBPF/P
FL502 Y DL
FL503 Y-LPF
Q509 (J-28)
CLIP COMPENSAT
CARRIER
DEVIATION
IC503
(I-27)
CXA1047M
PRE-EMPHASIS
FM MOD
KNEE & CAMERA WHITE CLIP
CLAMP
DARK CLIP
WHITE CLIP
MOD
CHROMA EMPHASIS
CHROMA AGC
MUTE
ENVELOPE DETECTOR
PEAK DETECTOR
Q504 2SC4081
(J-1) Q504
REC C BUFFER
REC C RF LEVEL
Q505 (I-25)
REC Y BUFFER
Q505 2SC2233
REC Y LEVEL
FL504
CE BPF
JL502
JL503
JL501
JL505
JL506
CN303
1 REC CAM C RF
2 REC CAM Y RF
3 CAM RF GND
4 CAM C
5 CAM Y
6 RF.SWP
FP-185 FLEXIBLE
TO VS-22 BOARD CN202
(See Page 171)
㉙
㉚
㉛
㉜

VC-60 BOARD (CR)



- Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC	➡	⇨		
PB				

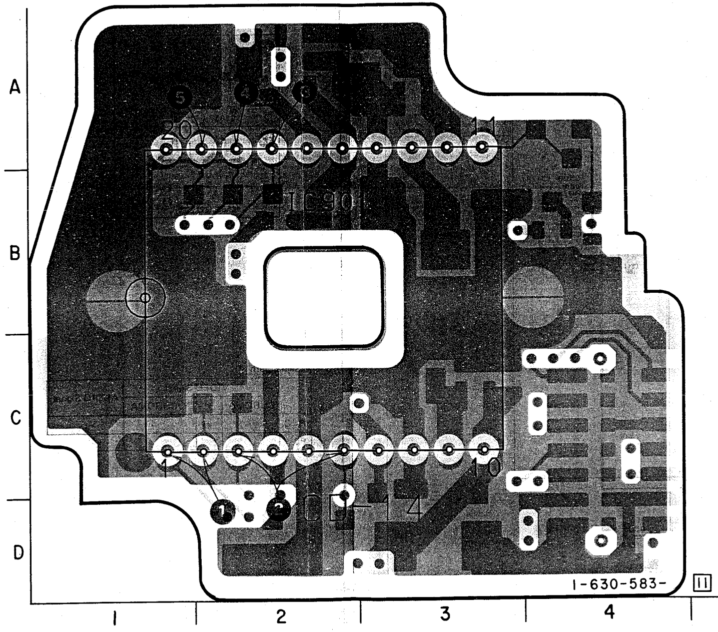
CD-14 (CCD IMAGER) PRINTED WIRING BOARDS

— Ref. No. CD-14 BOARD: 1000 series —

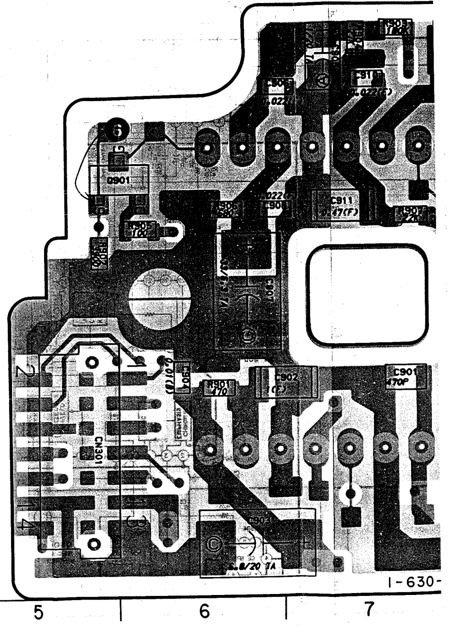
- **For printed wiring boards.**
- CD-14 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.

CD-14 BOARD（部品面側）


A
B
C
D
1
2
3
4
5
4
6
20
11
IC901
1
10
1
2
CD-14
1-630-583-
11

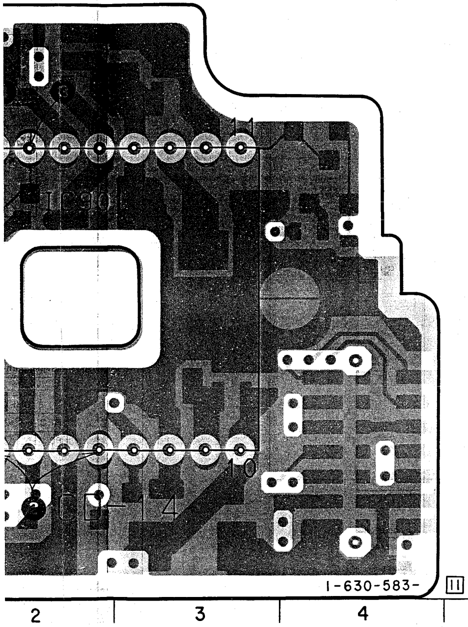
CD-14 BOARD（パターン面側）


6
D901
C911
.47(F)
C902
C901
470P
R901
470
CN301
2
4
5
6
7
1-630-

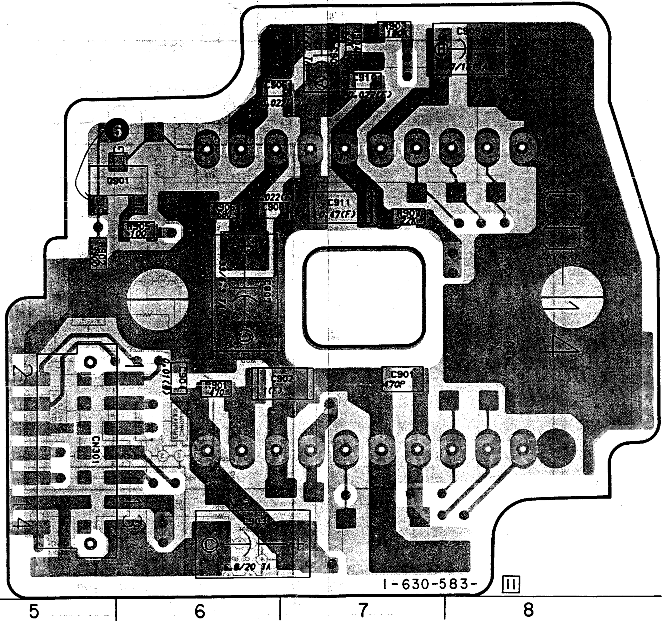
e side seen from
ated.

ide seen from the
d.

面側)

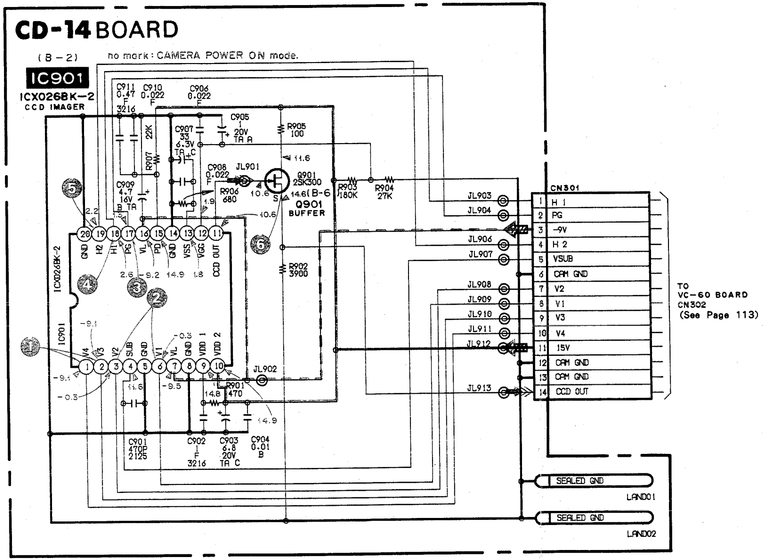

11
IC901
10
14
1-630-583-
11
2
3
4

CD-14 BOARD (パターン面側)

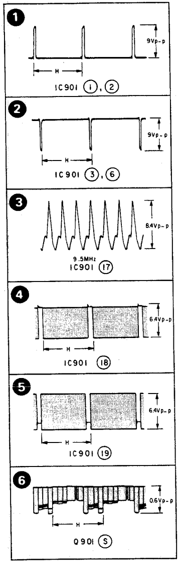

C909
C906
0.022
C910
0.022(F)
Q901
R905
100
R906
C908
C911
.047(F)
R907
22K
C907
CN301
R901
470
C902
1(F)
C901
470P
C903
6.8/20 TA
2
4
1-630-583-
11
5
6
7
8

CD-14 (CCD IMAGER) SCHEMATIC DIAGRAMS

— Ref. No. CD-14 BOARD: 1000 series —


CD-14 BOARD
(B-2)
no mark : CAMERA POWER ON mode.
IC901
ICX026BK-2
CCD IMAGER
C911 0.47 F 3216
C910 0.022 F
C906 0.022 F
C905 1 20V TA A
C907 33 6.3V TA C
R907
22K
R905 100
C908 0.022 F
JL901
Q901 2SK300
14.6(B-6
Q901 BUFFER
C909 4.7 16V B TA
R906 680
R903 180K
R904 27K
R902 3900
GND
H2
H1
PG
VL
PD
VSS
VGG
CCD OUT
V4
V3
V2
SUB
V1
VDD 1
VDD 2
ICX026BK-2
IC901
JL902
R901 470
C901 470P 2125
C902 1 F 3216
C903 6.8 20V TA C
C904 0.01 B
JL903
JL904
JL906
JL907
JL908
JL909
JL910
JL911
JL912
JL913
CN301
1 H 1
2 PG
3 -9V
4 H 2
5 VSUB
6 CAM GND
7 V2
8 V1
9 V3
10 V4
11 15V
12 CAM GND
13 CAM GND
14 CCD OUT
TO VC-60 BOARD CN302 (See Page 113)
SEALED GND
LAND01
SEALED GND
LAND02

CD-14 BOARD



- Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC			⇨	
PB				

CAUTIONS FOR REPLACING THE CCD IMAGER

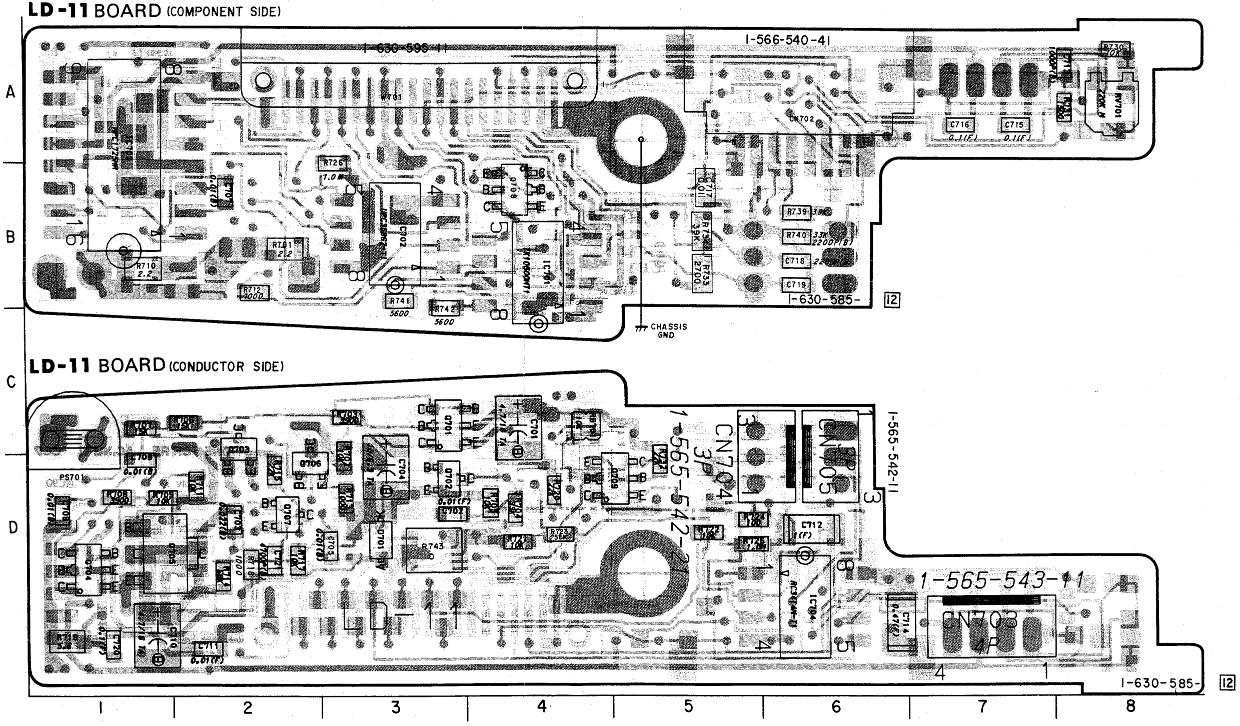
- According to type of CCD imager (IC901 on the CD-14 board), it is necessary to require the compensating ROM (IC003 on the DT-74 board).
  The repairing CCD imager does not require the compensating ROM.
  So when replacing the CCD imager on which the compensating ROM is installed, remove the compensating ROM before replacement.
- Since the mounted CD-14 and DT-74 boards ehich are supplied asa repair parts are not installed IC901 and IC003 respectively, replace the respective ICs from the previous board to the new when replacing each board.
- When you replaced the CCD imager, porform the overall camera head adjustment.
- CCD imager has such a structure that it may be spoiled by static electricityy, so handle it with a care similar for MOS IC. Further, be sure that the light receiving part has no stick of dust and no entry of bright light.

LD-11 (IRIS/FOCUS/ZOOM/MOTOR DRIVE) PRINTED WIRING BOARDS

— Ref. No. LD-11 BOARD: 3000 series —

- **For printed wiring boards.**
- LD-11 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

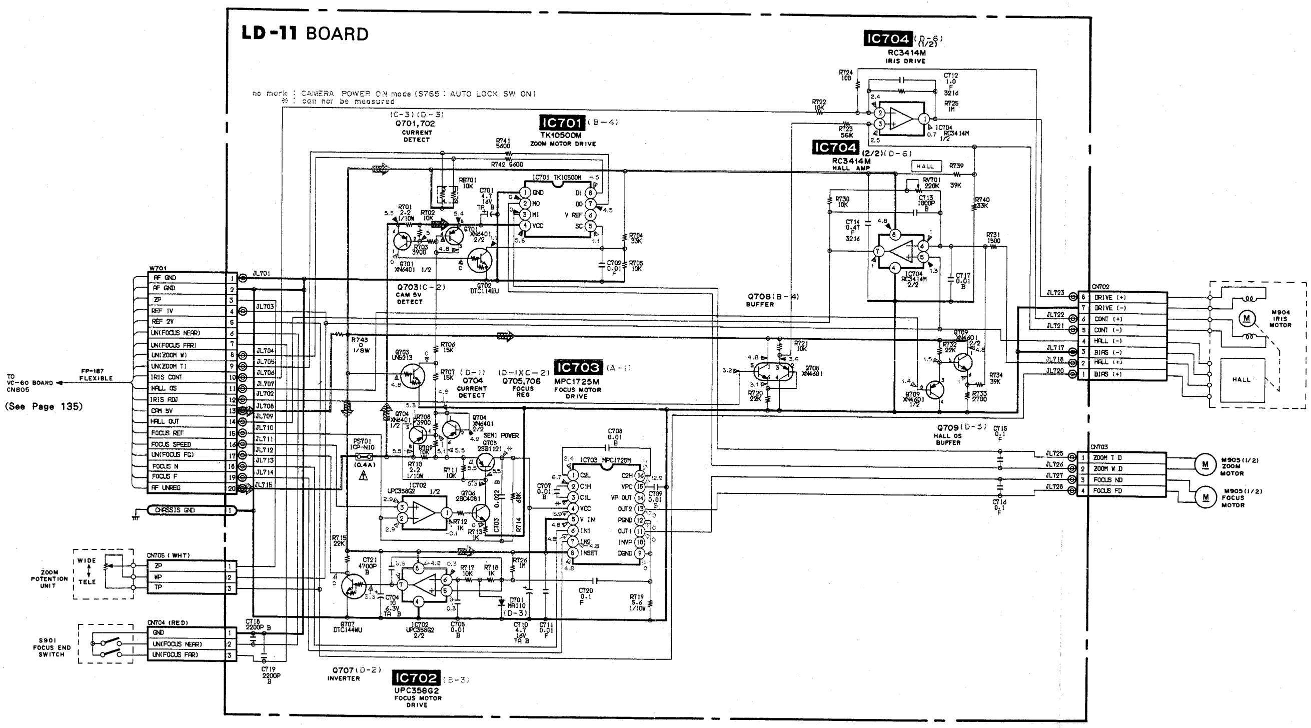
Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.


LD-11 BOARD (COMPONENT SIDE)
LD-11 BOARD (CONDUCTOR SIDE)
A
B
C
D
1
2
3
4
5
6
7
8
1-630-585-11
1-566-540-41
1-630-585-
12
IC701
IC702
IC703
CN702
CN703
4P
CN704
3P
CN705
3P
1-565-542-21
1-565-542-11
1-565-543-11
CHASSIS GND
R701
R710 2.2
R712 4000
R726 7.0
R741 5600
R742 5600
R739 39K
R740 33K
R733 2700
R734 39K
R730
RV701 220K
C716 0.1(F)
C715 0.1(F)
C717 0.01
C718 22
C719
C701
C702 0.01(F)
C704
C710
C711 0.01(F)
C712 1(F)
C714 0.47(F)
C720
Q701
Q702
Q703
Q704
Q705
Q706
Q707
Q708
Q709
D701
R743
R719
PS701

CAMERA MOTOR CAMERA MOTOR

LD-11 (IRIS/FOCUS/ZOOM/MOTOR DRIVE) SCHEMATIC DIAGRAMS

— Ref. No. LD-11 BOARD: 3000 series —


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
A B C D E F G H I J
LD-11 BOARD
no mark : CAMERA POWER ON mode (S765 : AUTO LOCK SW ON)
※ : can not be measured
IC701 (B-4) TK10500M ZOOM MOTOR DRIVE
IC702 (B-3) UPC358G2 FOCUS MOTOR DRIVE
IC703 (A-1) MPC1725M FOCUS MOTOR DRIVE
IC704 (D-6) (1/2) RC3414M IRIS DRIVE
IC704 (2/2) (D-6) RC3414M HALL AMP
(C-3) (D-3) Q701,702 CURRENT DETECT
Q703 (C-2) CAM 5V DETECT
Q704 (D-1) CURRENT DETECT
(D-1) (C-2) Q705,706 FOCUS REG
Q707 (D-2) INVERTER
Q708 (B-4) BUFFER
Q709 (D-5) HALL OS BUFFER
W701
RF GND
RF GND
ZP
REF 1V
REF 2V
UN(FOCUS NEAR)
UN(FOCUS FAR)
UN(ZOOM W)
UN(ZOOM T)
IRIS CONT
HALL OS
IRIS ADJ
CAM 5V
HALL OUT
FOCUS REF
FOCUS SPEED
UN(FOCUS FG)
FOCUS N
FOCUS F
RF UNREG
CHASSIS GND
TO VC-60 BOARD CN805
FP-187 FLEXIBLE
(See Page 135)
CN705 (WHT)
ZP
WP
TP
ZOOM POTENTION UNIT
WIDE
TELE
CN704 (RED)
GND
UN(FOCUS NEAR)
UN(FOCUS FAR)
S901 FOCUS END SWITCH
CN702
DRIVE (+)
DRIVE (-)
CONT (+)
CONT (-)
HALL (-)
BIAS (-)
HALL (+)
BIAS (+)
M904 IRIS MOTOR
HALL
CN703
ZOOM T D
ZOOM W D
FOCUS ND
FOCUS FD
M905 (1/2) ZOOM MOTOR
M905 (1/2) FOCUS MOTOR
PS701 ICP-N10 (0.4A)
SEMI POWER
D701 MA110 (D-3)

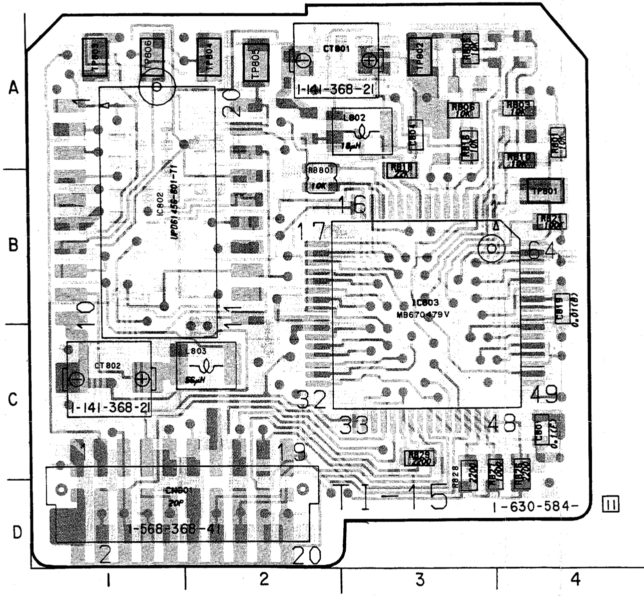
TI-15 (DIGITAL TITLER) PRINTED WIRING BOARDS

— Ref. No. TI-15 BOARD: 4000 series —

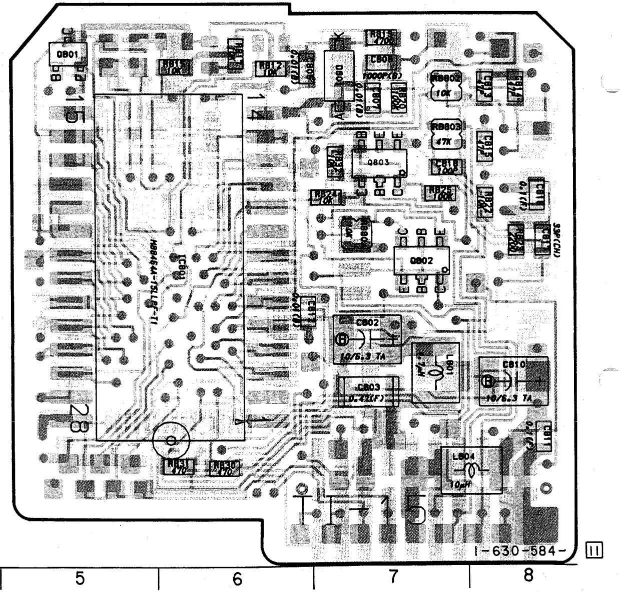
- **For printed wiring boards.**
- TI-15 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.

TI-15 BOARD (COMPONENT SIDE)

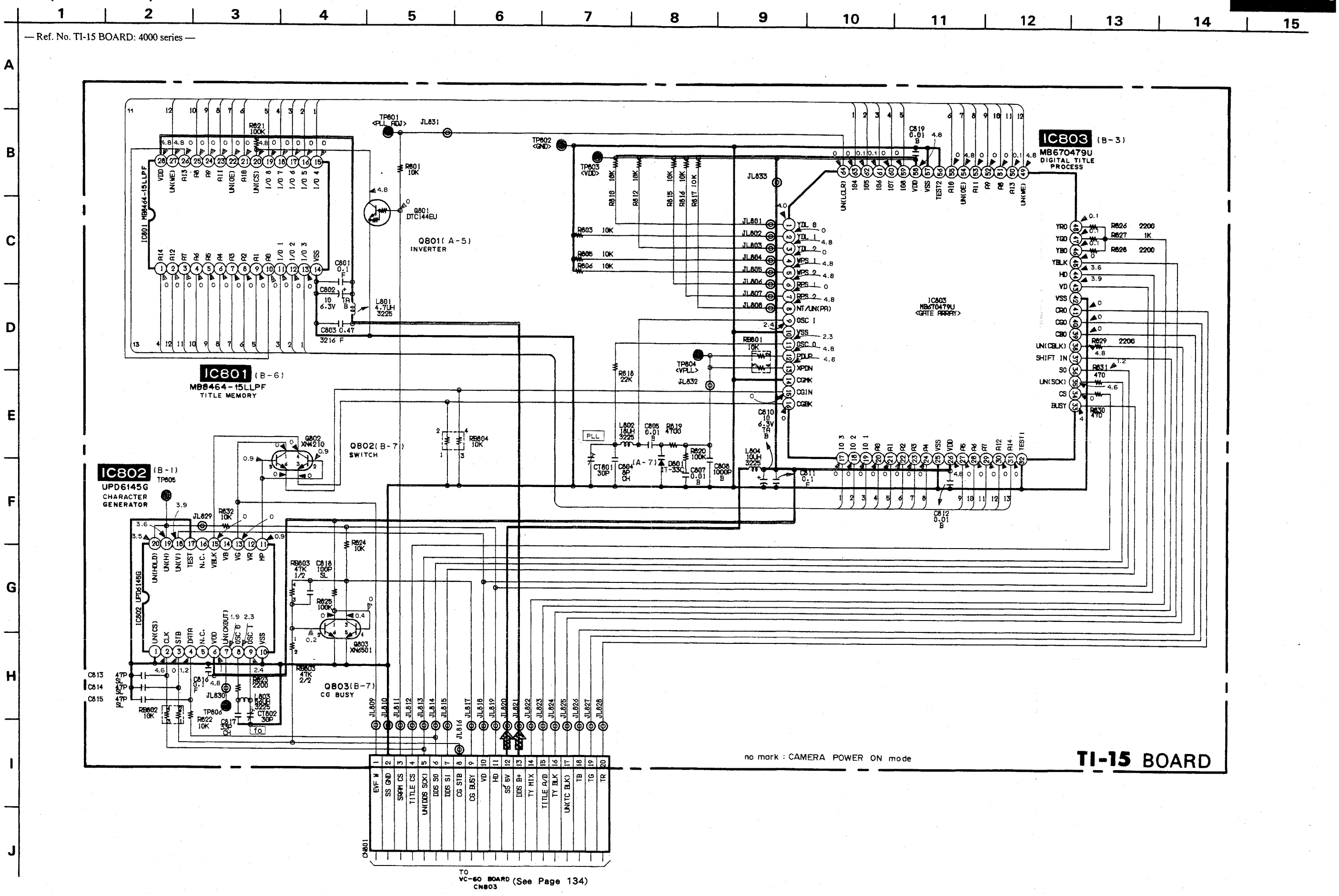

A
B
C
D
1
2
3
4
TP806
TP804
TP803
TP805
CT801
1-141-368-21
TP802
L802
18μH
R8801
10K
IC802
UPD6145G-001-T1
IC803
MB670479V
CB19
0.01(B)
TP801
CT802
1-141-368-21
L803
56μH
CN801
20P
1-568-368-41
TI-15
1-630-584-
11
1
20
10
11
16
17
64
32
33
48
49
2
20

TI-15 BOARD (CONDUCTOR SIDE)


5
6
7
8
QB01
QB02
QB03
CB08
1000P(B)
RB02
10K
RB03
47K
CB02
10/6.3 TA
CB03
0.47μ(F)
CB10
10/6.3 TA
LB01
LB04
10μH
RB31
470
RB30
470
39P(CH)
1
15
28
TI-15
1-630-584-
11

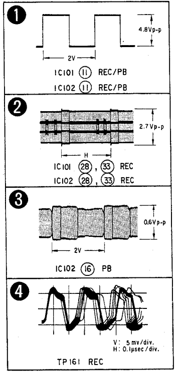
TI-15 (DIGITAL TITLER) SCHEMATIC DIAGRAMS

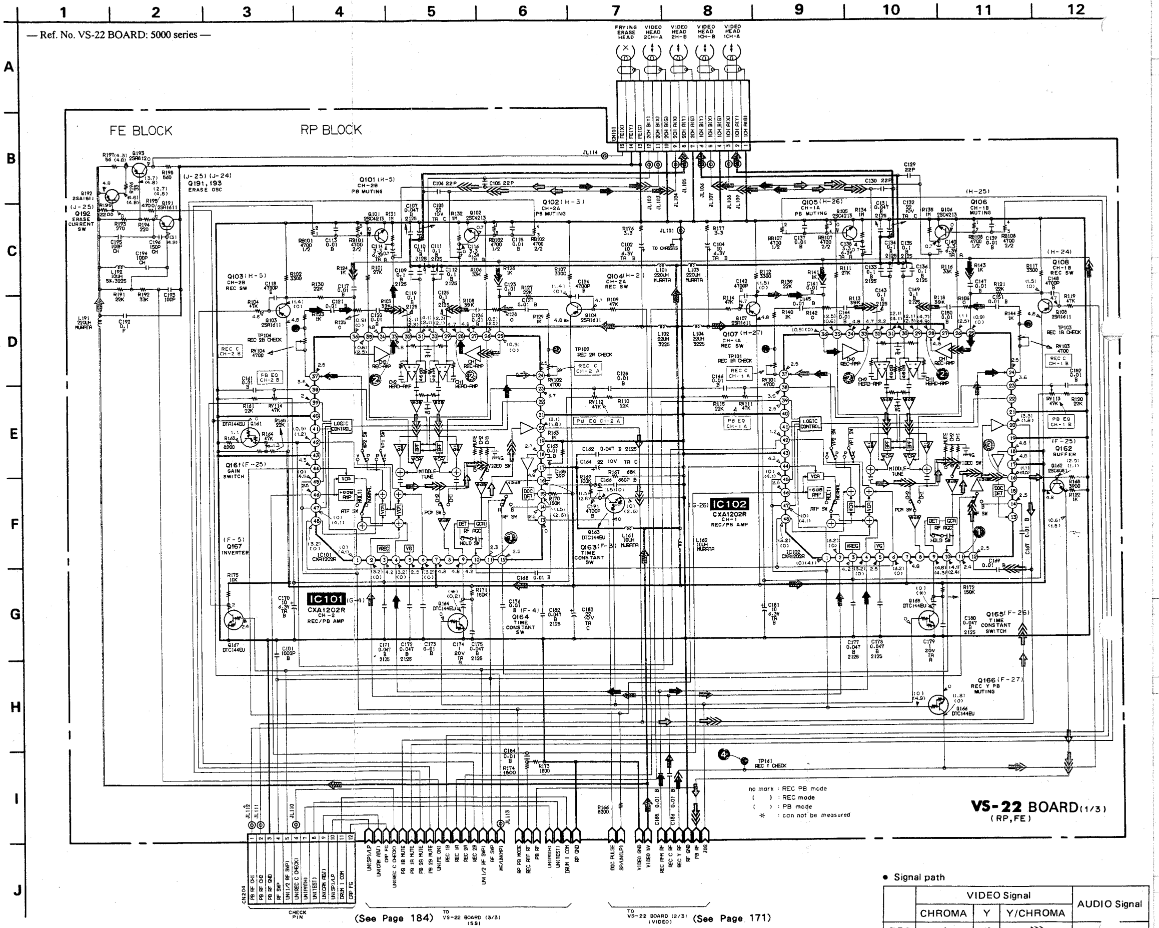
— Ref. No. TI-15 BOARD: 4000 series —


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
IC801 (B-6)
MB8464-15LLPF
TITLE MEMORY
IC802 (B-1)
UPD6145G
CHARACTER GENERATOR
IC803 (B-3)
MB670479U
DIGITAL TITLE PROCESS
IC803
MB670479U
<GATE ARRAY>
Q801 (A-5)
INVERTER
Q801
DTC144EU
Q802 (B-7)
SWITCH
Q802
XN4210
Q803 (B-7)
CG BUSY
Q803
XN6501
TP801
<PLL ADJ>
TP802
<GND>
TP803
<VDD>
TP804
<VPLL>
TP805
TP806
JL831
JL833
JL832
JL829
JL830
R821
100K
R801
10K
C801
0.1
F
C802
10
6.3V
L801
4.7UH
3225
C803 0.47
3216 F
C819
0.01
B
R803 10K
R805 10K
R806 10K
R810 10K
R812 10K
R815 10K
R816 10K
R817 10K
RB801
10K
R818
22K
PLL
CT801
30P
C804
8P
CH
L802
18UH
3225
C805
0.01
B
R819
4700
D801
1T-33C
R820
100K
C807
0.01
B
C808
1000P
B
C810
10
6.3V
TA
L804
10UH
3225
C811
0.1
F
C812
0.01
B
R826 2200
R827 1K
R828 2200
R829 2200
R831
470
R830
470
RB804
10K
R832
10K
R824
10K
RB803
47K
1/2
C818
100P
SL
R825
100K
RB803
47K
2/2
C813 47P SL
C814 47P SL
C815 47P SL
RB802
10K
R822
10K
C816
0.1
F
C817
33P
CH
R823
2200
L803
530UH
3225
CT802
30P
fo
UN(LCLR)
VDD
UN(WE)
A13
A8
A9
A11
UN(OE)
A10
UN(CS)
I/O 8
I/O 7
I/O 6
I/O 5
I/O 4
A14
A12
A7
A6
A5
A4
A3
A2
A1
A0
I/O 1
I/O 2
I/O 3
VSS
YDL 0
YDL 1
YDL 2
VPS 1
VPS 2
RPS 1
RPS 2
NT/UN(PA)
OSC I
VSS
OSC 0
PDLP
XPDN
CGHK
CGIN
CGBK
TEST2
YR0
YG0
YB0
YBLK
HD
VD
VSS
CR0
CG0
CB0
UN(CBLK)
SHIFT IN
SO
UN(SCK)
CS
BUSY
TEST1
UN(HOLD)
UN(H)
UN(V)
TEST
N.C.
VBLK
VB
VG
VR
HP
UN(CS)
CLK
STB
DATA
N.C.
VDD
UN(CKOUT)
OSC 0
OSC I
VSS
JL801
JL802
JL803
JL804
JL805
JL806
JL807
JL808
JL809
JL810
JL811
JL812
JL813
JL814
JL815
JL816
JL817
JL818
JL819
JL820
JL821
JL822
JL823
JL824
JL825
JL826
JL827
JL828
CN801
1 EVF W
2 SS GND
3 SPOH CS
4 TITLE CS
5 UN(DDS SCK)
6 DDS SO
7 DDS SI
8 CG STB
9 CG BUSY
10 VD
11 HD
12 SS 5V
13 DDS B+
14 TY MIX
15 TITLE A/D
16 TY BLK
17 UN(TC BLK)
18 TB
19 TG
20 TR
TO
VC-60 BOARD
CN803
(See Page 134)
no mark : CAMERA POWER ON mode
TI-15 BOARD

VS-22 (HEAD AMP) SCHEMATIC DIAGRAMS

VS-22 BOARD (RP/FE)

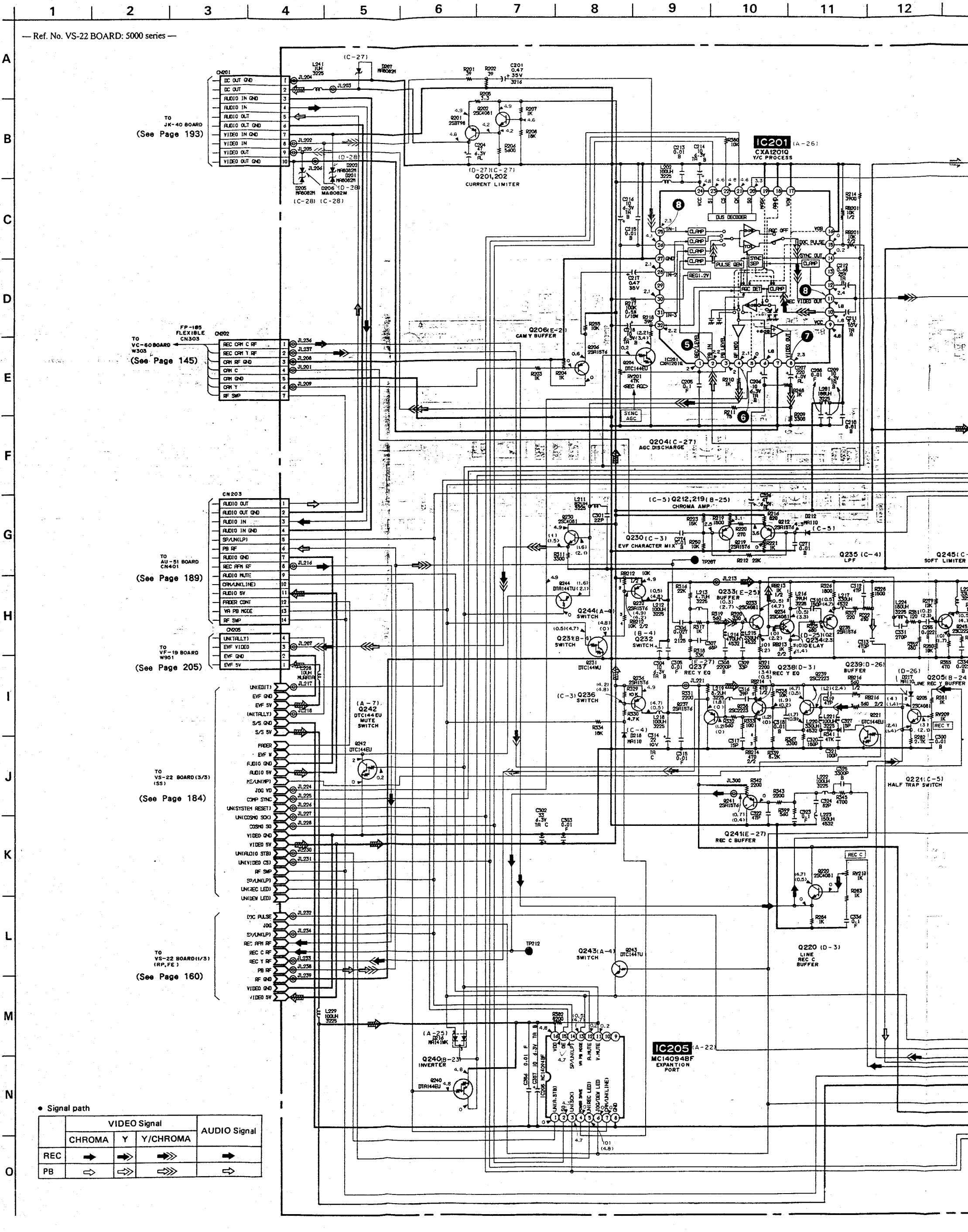



— Ref. No. VS-22 BOARD: 5000 series —
FE BLOCK
RP BLOCK
FRYING ERASE HEAD
VIDEO HEAD 2CH-A
VIDEO HEAD 2H-B
VIDEO HEAD 1CH-B
VIDEO HEAD 1CH-A
Q192 ERASE CURRENT SW
Q191, 193 ERASE OSC
Q101 (H-5) CH-2B PB MUTING
Q102 (H-3) CH-2A PB MUTING
Q105 (H-26) CH-1A PB MUTING
Q106 (H-25) CH-1B MUTING
Q103 (H-5) CH-2B REC SW
Q104 (H-2) CH-2A REC SW
Q107 (H-27) CH-1A REC SW
Q108 (H-24) CH-1B REC SW
Q161 (F-25) GAIN SWITCH
Q162 (F-25) BUFFER
Q163 (F-3) TIME CONSTANT SW
Q164 (F-4) TIME CONSTANT SW
Q165 (F-26) TIME CONSTANT SWITCH
Q166 (F-27) REC Y PB MUTING
Q167 (F-5) INVERTER
IC101 (G-4) CXA1202R CH-2 REC/PB AMP
IC102 (G-26) CXA1202R CH-1 REC/PB AMP
TP161 REC Y CHECK
no mark : REC PB mode
( ) : REC mode
⟨ ⟩ : PB mode
* : can not be measured
VS-22 BOARD (1/3) (RP,FE)
CHECK PIN
(See Page 184)
TO VS-22 BOARD (3/3) (SS)
TO VS-22 BOARD (2/3) (VIDEO)
(See Page 171)

- Signal path

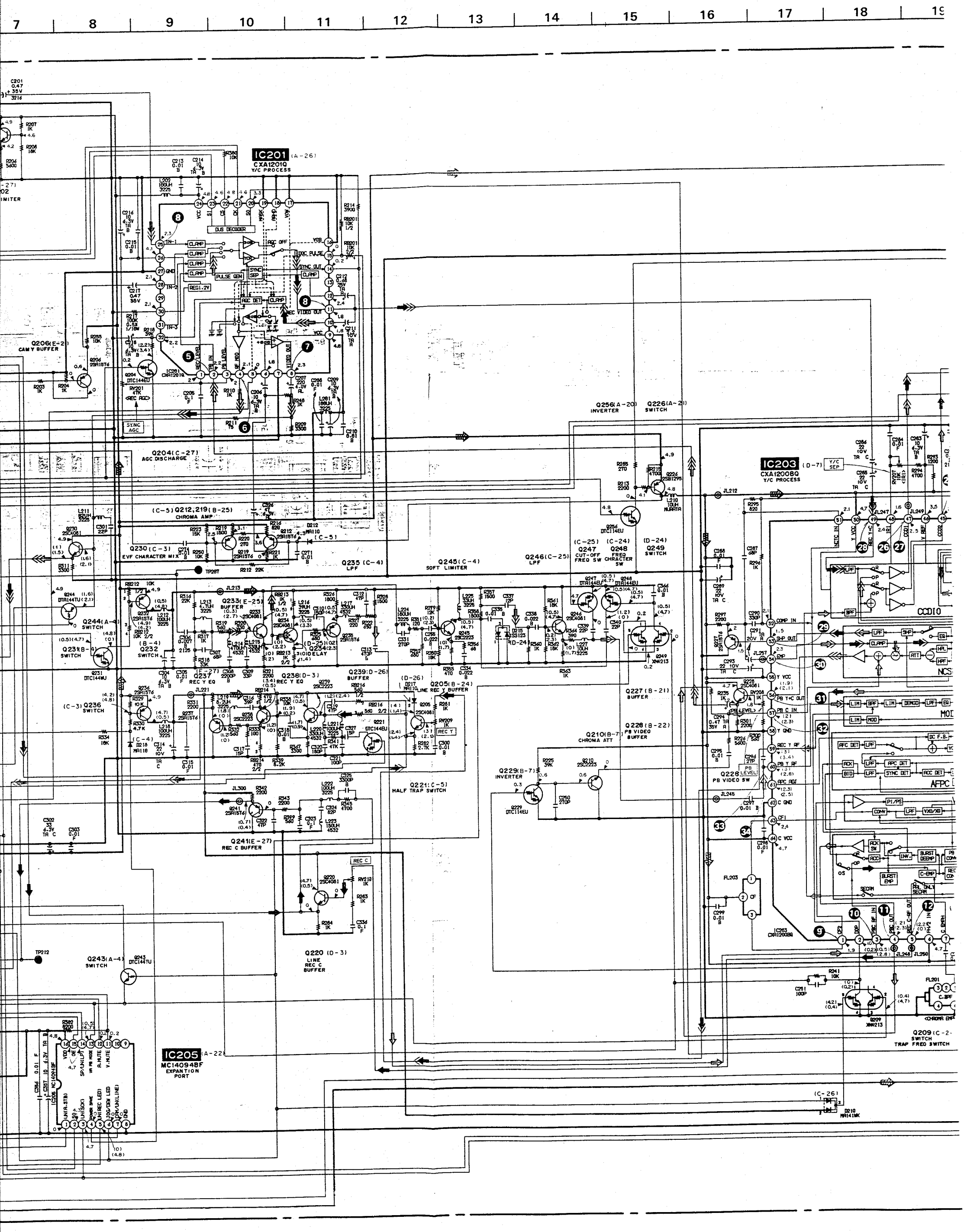
	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	
PB			⇨	⇨

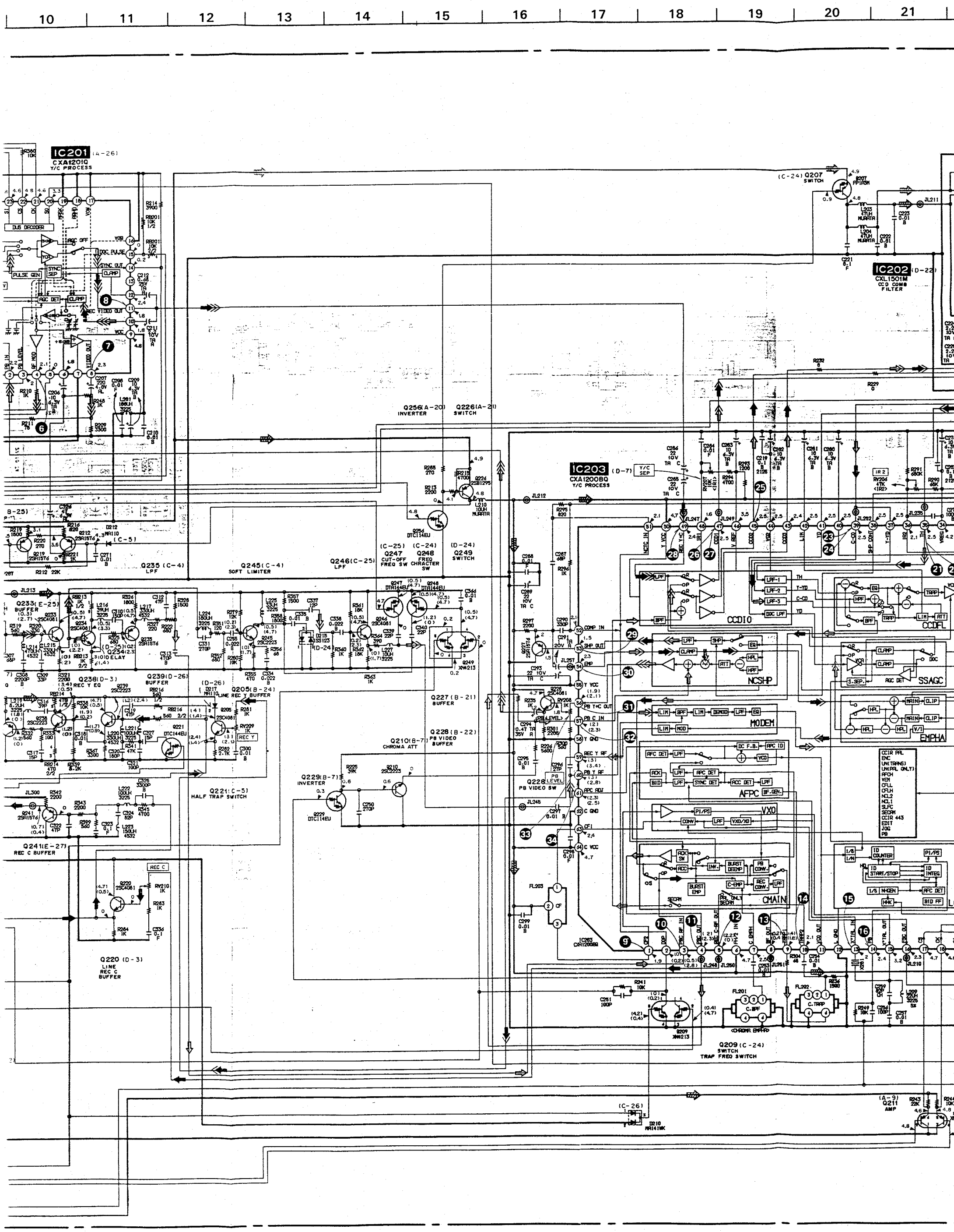
— Ref. No. VS-22 BOARD: 5000 series —

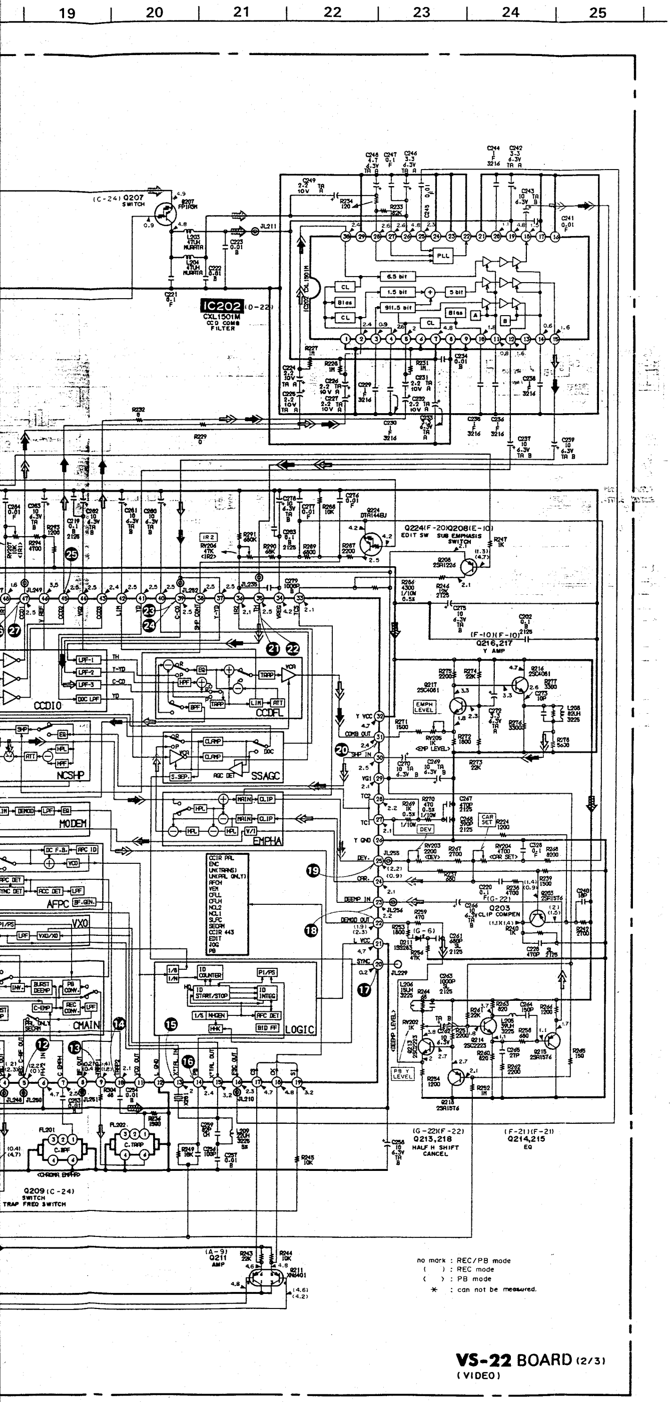

1
2
3
4
5
6
7
8
9
10
11
12
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
CN201
DC OUT GND
DC OUT
AUDIO IN GND
AUDIO IN
AUDIO OUT
AUDIO OUT GND
VIDEO IN GND
VIDEO IN
VIDEO OUT
VIDEO OUT GND
TO JK-40 BOARD
(See Page 193)
Q201,202
CURRENT LIMITER
IC201
CXA1201Q
Y/C PROCESS
DUS DECODER
CLAMP
PULSE GEN
SYNC SEP
AGC DET
AGC OFF
REG1.2V
DOC PULSE
SYNC OUT
VIDEO OUT
FP-185 FLEXIBLE CN303
TO VC-60 BOARD W303
(See Page 145)
CN202
REC CPM C RF
REC CPM Y RF
CPM RF GND
CPM C
CPM GND
CPM Y
RF SWP
Q206
CAM Y BUFFER
Q204
AGC DISCHARGE
RV201
REC AGC
SYNC AGC
CN203
AUDIO OUT
AUDIO OUT GND
AUDIO IN
AUDIO IN GND
SP/LN(LP)
PB RF
AUDIO GND
REC AFM RF
AUDIO MUTE
CPM/LN(LINE)
AUDIO 5V
FADER CONT
VR PB MODE
RF SWP
TO AU-51 BOARD CN401
(See Page 189)
CN205
LN(TALLY)
EVF VIDEO
EVF GND
EVF 5V
TO VF-19 BOARD W951
(See Page 205)
TO VS-22 BOARD(3/3) (SS)
(See Page 184)
TO VS-22 BOARD(1/3) (RP,FE)
(See Page 160)
Q212,219
CHROMA AMP
Q230
EVF CHARACTER MIX
Q235
LPF
Q245
SOFT LIMITER
Q244
SWITCH
Q231
SWITCH
Q232
SWITCH
Q233
BUFFER
Q234
DELAY
Q236
SWITCH
Q237
REC Y EQ
Q238
Q239
BUFFER
Q205
LINE REC Y BUFFER
Q242
DTC144EU
MUTE SWITCH
Q221
HALF TRAP SWITCH
Q241
REC C BUFFER
Q220
LINE REC C BUFFER
Q243
SWITCH
Q240
INVERTER
IC205
MC14094BF
EXPANTION PORT
TP207
TP212

● Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC	➡	➡➡	➡➡➡	➡
PB	⇨	⇨⇨	⇨⇨⇨	⇨


7
8
9
10
11
12
13
14
15
16
17
18
IC201 (A-26)
CXA1201Q
Y/C PROCESS
DLS DECODER
CLAMP
PULSE GEN
SYNC SEP
AGC DET
REG1.2V
AGC OFF
DOC PULSE
SYNC OUT
REC VIDEO OUT
Q206(E-2) CAM Y BUFFER
Q204(C-27) AGC DISCHARGE
SYNC AGC
RV201 47K (REC AGC)
(C-5) Q212,219(B-25) CHROMA AMP
Q230(C-3) EVF CHARACTER MIX
Q235 (C-4) LPF
Q245(C-4) SOFT LIMITER
Q246(C-25) LPF
Q256(A-20) INVERTER
Q226(A-21) SWITCH
(C-25) Q247 CUT-OFF FREQ SW
(C-24) Q248 FREQ CHARACTER SW
(D-24) Q249 SWITCH
Q244(A-4) SWITCH
Q231(B-3) SWITCH
Q233(E-25) BUFFER
Q232 SWITCH
Q237 REC Y EQ
Q238(D-3) REC Y EQ
Q234 DELAY
Q239(D-26) BUFFER
Q205(B-24) LINE REC Y BUFFER
(C-3) Q236 SWITCH
Q227(B-21) BUFFER
Q228(B-22) PB VIDEO BUFFER
Q210(B-7) CHROMA ATT
Q229(B-7) INVERTER
Q221(C-5) HALF TRAP SWITCH
Q241(E-27) REC C BUFFER
Q220 (D-3) LINE REC C BUFFER
Q243(A-4) SWITCH
IC205 (A-22)
MC14094BF
EXPANTION PORT
IC203 (D-7)
CXA1200BQ
Y/C PROCESS
Y/C SEP
CCDIO
NCS
MOD
AFPC
Q226 PB VIDEO SW
PB LEVEL
Q209 (C-2) SWITCH TRAP FREQ SWITCH
D210 MA141WK
FL201
FL203
TP287
TP212
JL213
JL212
JL245
JL300

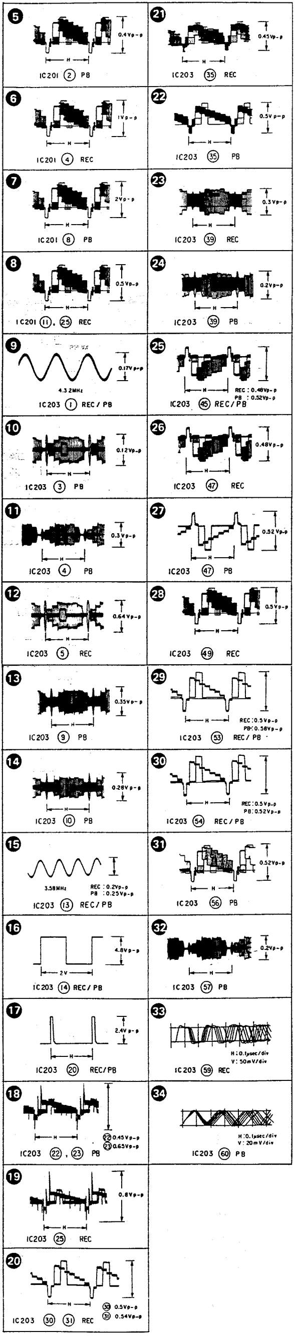

10
11
12
13
14
15
16
17
18
19
20
21
IC201 (A-26)
CXA1201Q
Y/C PROCESS
IC202 (D-22)
CXL1501M
CCD COMB FILTER
IC203 (D-7)
CXA1200BQ
Y/C PROCESS
Y/C SEP
(C-24) Q207 SWITCH
Q256(A-20) INVERTER
Q226(A-21) SWITCH
Q235 (C-4) LPF
Q245 (C-4) SOFT LIMITER
Q246(C-25) LPF
(C-25) Q247 CUT-OFF FREQ SW
(C-24) Q248 FREQ CHARACTER SW
(D-24) Q249 SWITCH
Q233(E-25) BUFFER
Q234(D-25) DELAY
Q238(D-3) REC Y EQ
Q239(D-26) BUFFER
(D-26) D217 MA110
Q205(B-24) LINE REC Y BUFFER
Q227 (B-21) BUFFER
Q228 (B-22) PB VIDEO BUFFER
Q210(B-7) CHROMA ATT
Q229(B-7) INVERTER
Q221(C-5) HALF TRAP SWITCH
Q241(E-27) REC C BUFFER
Q220 (D-3) LINE REC C BUFFER
Q228 PB VIDEO SW
Q209 (C-24) SWITCH TRAP FREQ SWITCH
(A-9) Q211 AMP
(C-26) D210 MA141WK
DUS DECODER
PULSE GEN
SYNC SEP
AGC DET
CLAMP
AGC OFF
DOC PULSE
SYNC OUT
REC VIDEO OUT
VIDEO OUT
VCC
PB LEVEL
NF MOD
CCD10
CCDFL
NCSHP
SSAGC
MODEM
EMPHA
AFPC
VXO
CMAIN
PB Y+C OUT
PB C IN
Y GND
REC Y RF
PB Y RF
APC ADJ
C GND
CF1
C VCC
COMP IN
SHP OUT
EMP
Y VCC
FL203
FL201 C.BPF
FL202 C.TRAP
CHROMA EMPHA
IC203 CXA1200BQ
CCIR PAL
ENC
UN(TRANS)
UN(PAL ONLY)
AFCH
VEH
CFLL
CFLH
NCL2
NCL1
SLPC
SECAM
CCIR 443
EDIT
JOG
PB
ID COUNTER
ID START/STOP
ID INTEG
1/S NHGEN
AFC DET
HHK
BID FF
REC C


19
20
21
22
23
24
25
IC202 (D-22)
CXL1501M
CCD COMB FILTER
Q207 (C-24)
SWITCH
PLL
6.5 bit
1.5 bit
5 bit
911.5 bit
CL
Bias
Q224(F-20) Q208(E-10)
EDIT SW
SUB EMPHASIS SWITCH
Q216,217 (F-10)(F-10)
Y AMP
CCDIO
CCDFL
NCSHP
SSAGC
MODEM
EMPHA
AFPC
VXO
CMAIN
LOGIC
Q203 (G-22)
CLIP COMPEN
Q213,218 (G-22)(F-22)
HALF H SHIFT CANCEL
Q214,215 (F-21)(F-21)
EQ
Q209 (C-24)
SWITCH
TRAP FREQ SWITCH
Q211 (A-9)
AMP
FL201
C.BPF
FL202
C.TRAP

no mark : REC/PB mode
( ) : REC mode
( ) : PB mode
* : can not be measured.

VS-22 BOARD (2/3)
(VIDEO)

VS-22 BOARD (VIDEO)



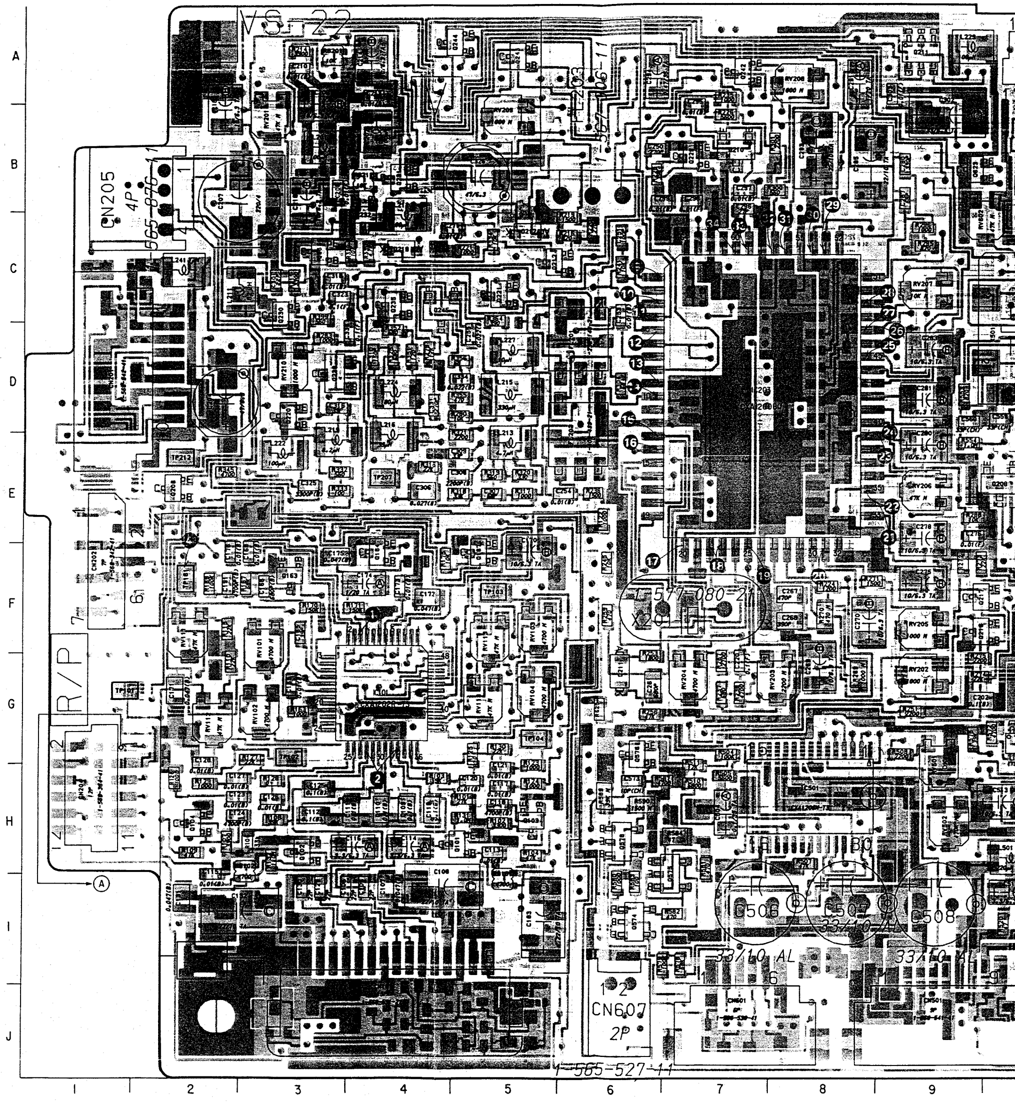
VS-22 (HEAD AMP, VIDEO, SERVO/SYSTEM CONTROL) PRINTED WIRING BOARDS

— Ref. No. VS-22 BOARD: 5000 series —

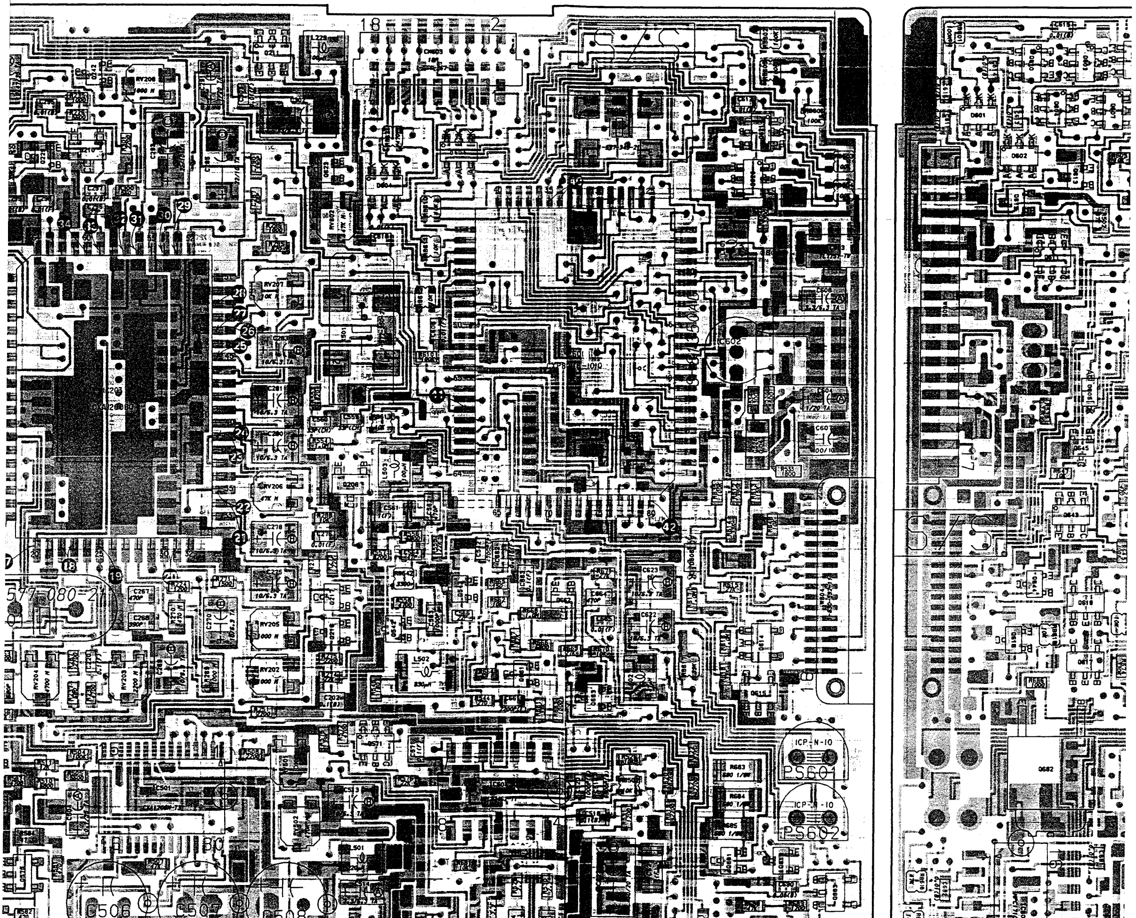
- **For printed wiring boards.**
- VS-22 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side. (Component side)	Parts on the parts face side seen from the pattern face are indicated.

VS-22 BOARD (COMPONENT SIDE)

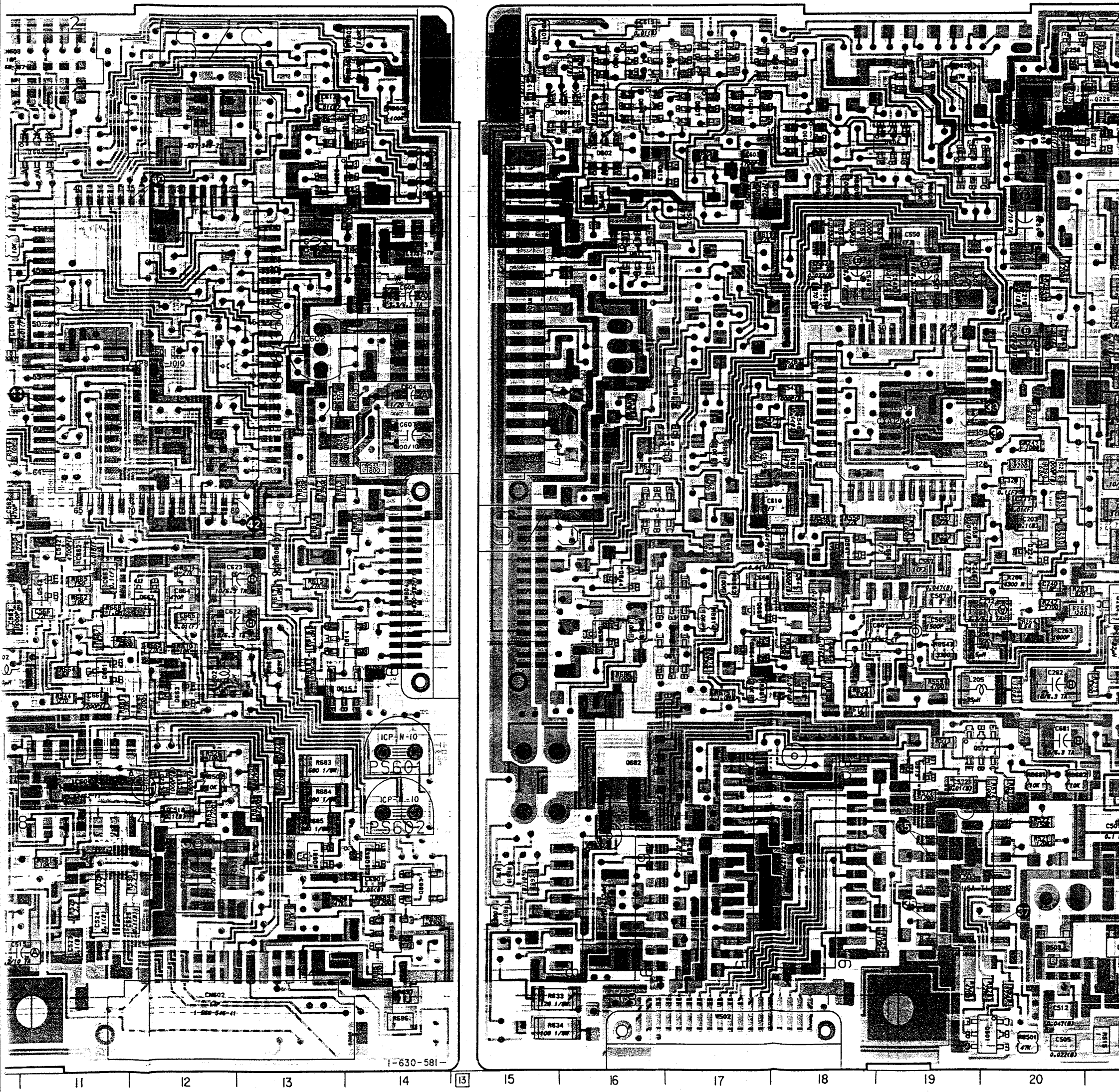

VS-22
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9
CN205
4P
1-565-876-11
R/P
CN607
2P
1-565-527-11
1-577-080-21
X20
C506
33/10 AL
C507
33/10 AL
C508
33/10 AL
A

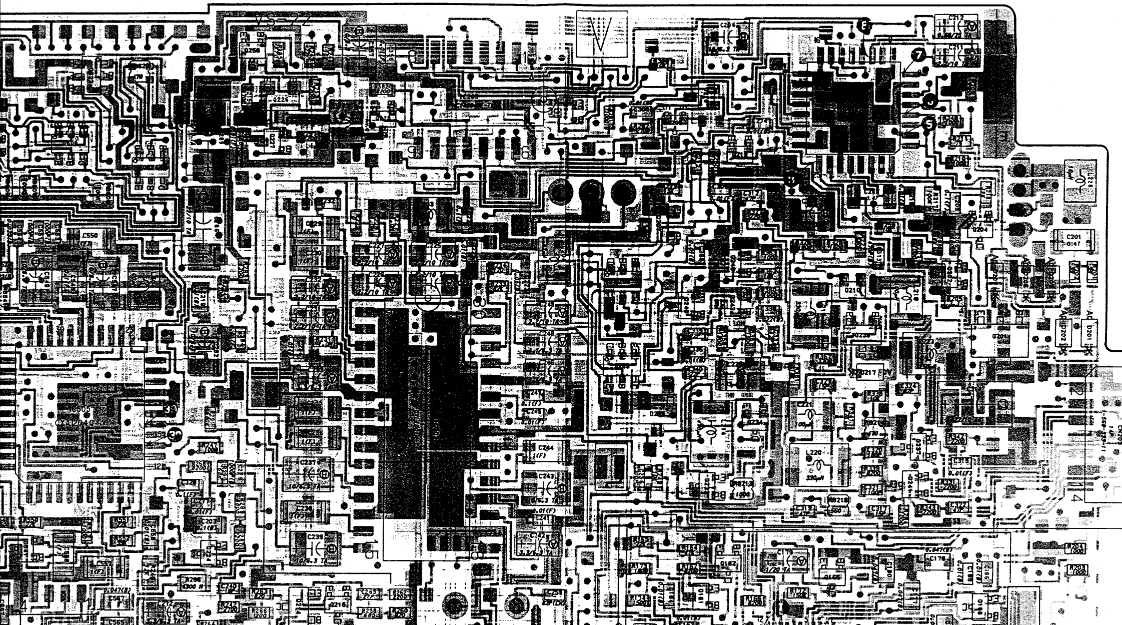
VS-22 BOARD (CONDUCTOR SIDE)



577-080-21
C506
C507
C508
33/10 AL
ICP-N-10
PS601
PS602
CN501
CN502
CN603
1-630-581-
7
8
9
10
11
12
13
14
13
15
16

VS-22 BOARD (CONDUCTOR SIDE)


ICP-N-10
PS601
ICP-N-10
PS602
CN602
1-630-581
Q602
C550
C610
Q682
R683
R684
R685
R633
R634
C512
C505
R501
L205
C262
C263
C681
42
11
12
13
14
13
15
16
17
18
19
20

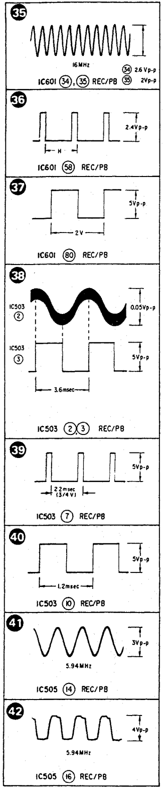

VS-22
R/P
1-630-581-
13
18
19
20
21
22
23
24
25
26
27
28

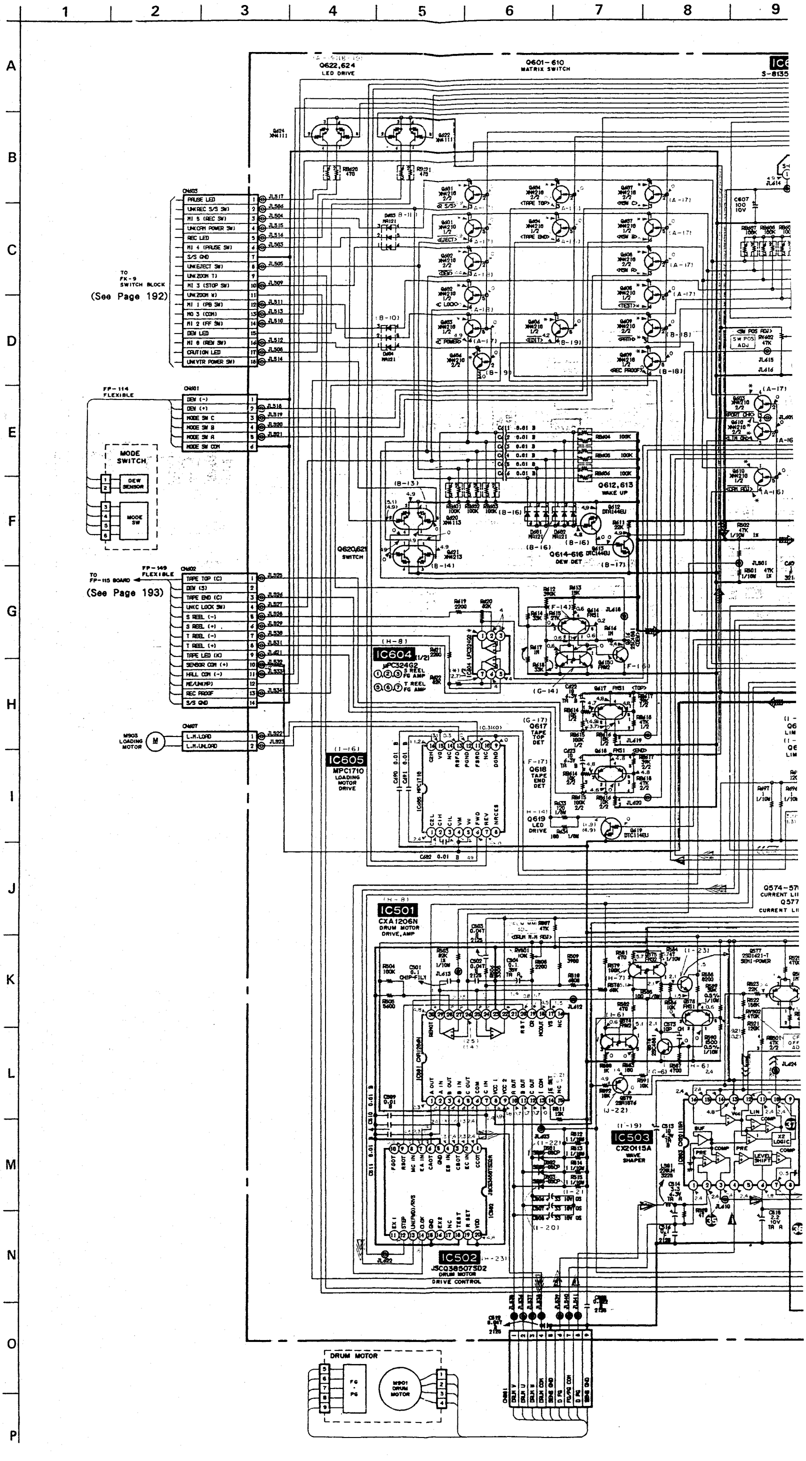
SERVO/SYSTEM CONTROL

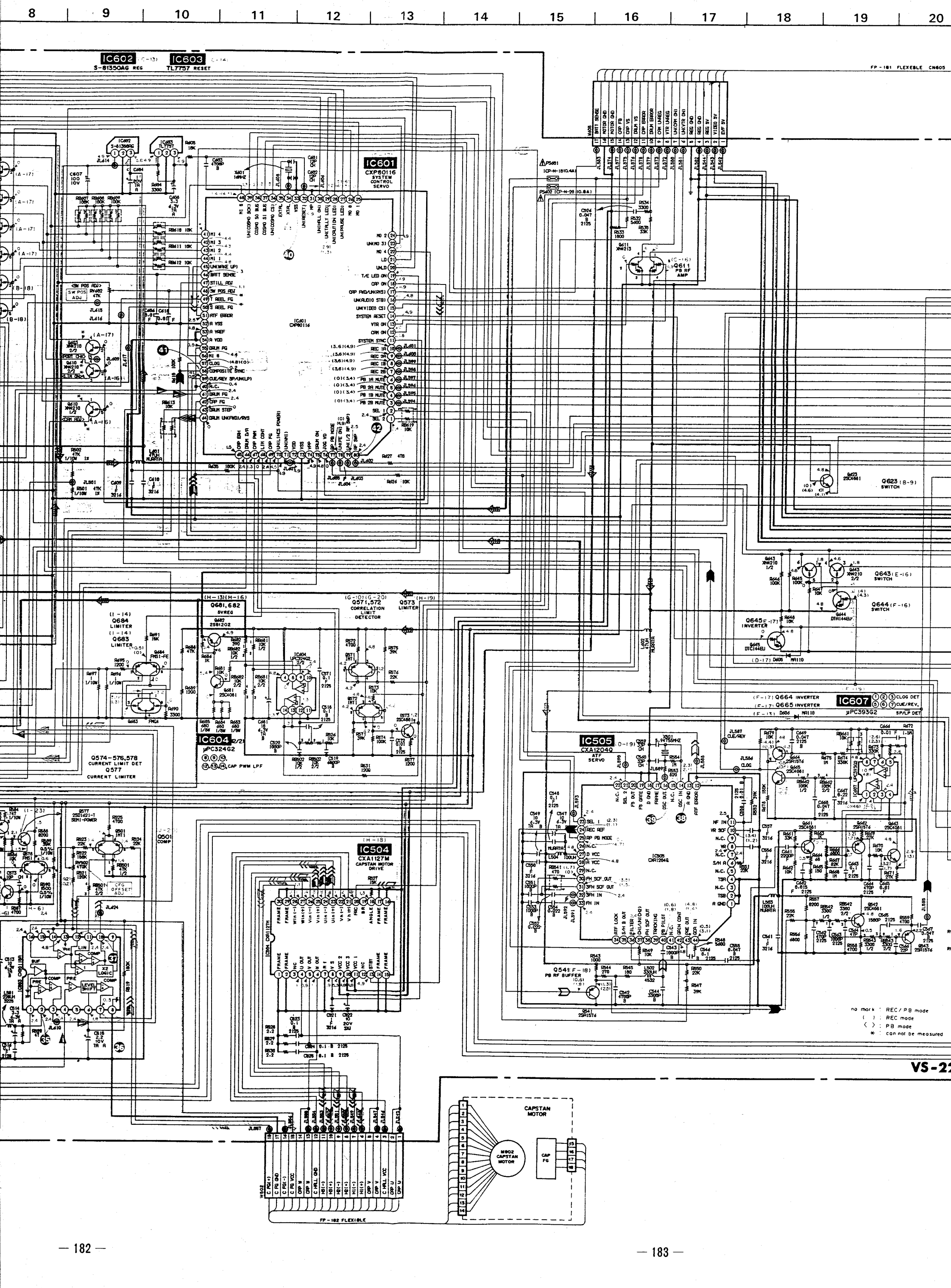
SERVO/SYSTEM CONTROL

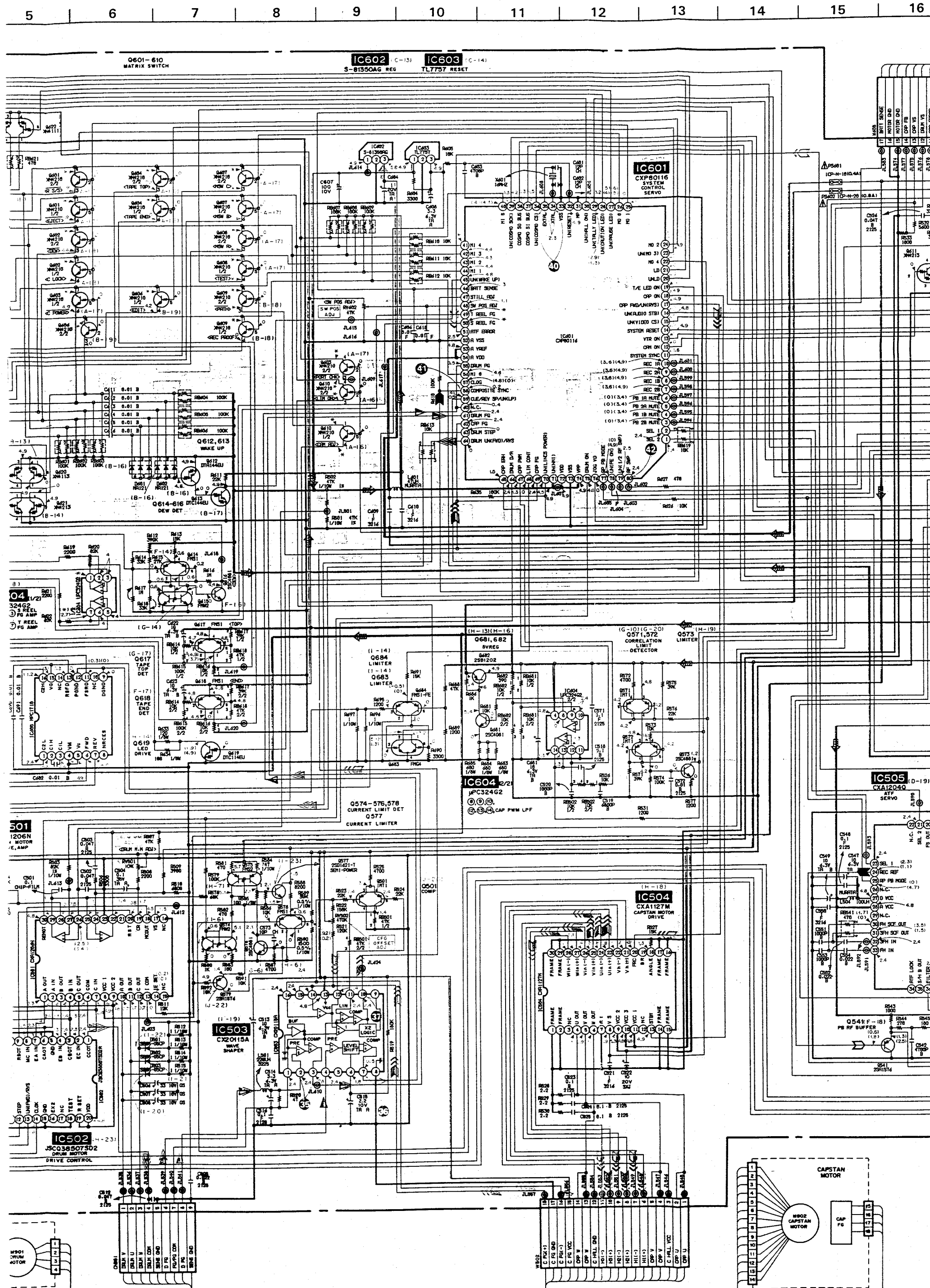
VS-22 (SERVO/SYSTEM CONTROL) SCHEMATIC DIAGRAMS

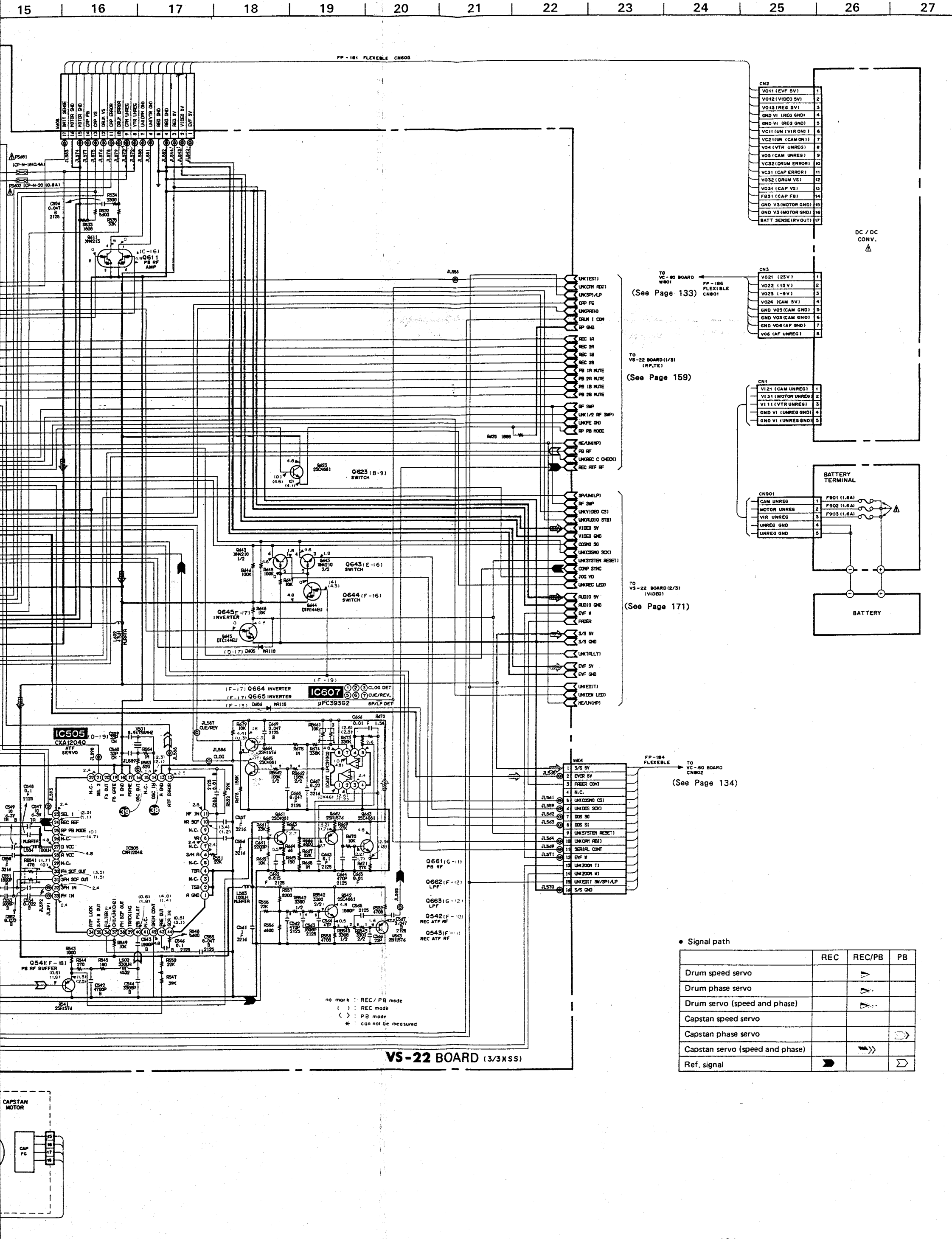
VS-22 BOARD (SYSCON/SERVO)




1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q622,624 LED DRIVE
Q601-610 MATRIX SWITCH
CN603
PAUSE LED
UNI(REC S/S SW)
MI 5 (REC SW)
UNI(CAM POWER SW)
REC LED
MI 4 (PAUSE SW)
S/S GND
UNI(EJECT SW)
UNI(ZOOM T)
MI 3 (STOP SW)
UNI(ZOOM W)
MI 1 (PB SW)
MO 3 (COM)
MI 2 (FF SW)
DEW LED
MI 6 (REW SW)
CAUTION LED
UNI(VTR POWER SW)
TO FK-9 SWITCH BLOCK
(See Page 192)
FP-114 FLEXIBLE
CN601
DEW (-)
DEW (+)
MODE SW C
MODE SW B
MODE SW A
MODE SW COM
MODE SWITCH
DEW SENSOR
MODE SW
Q620,621 SWITCH
Q612,613 WAKE UP
Q614-616 DEW DET
TO FP-115 BOARD
FP-149 FLEXIBLE
(See Page 193)
CN602
TAPE TOP (C)
DEW (S)
TAPE END (C)
UNI(C LOCK SW)
S REEL (-)
S REEL (+)
T REEL (-)
T REEL (+)
TAPE LED (K)
SENSOR COM (+)
HALL COM (-)
ME/UNI(MP)
REC PROOF
S/S GND
IC604
μPC324G2
1 2 3 S REEL FG AMP
5 6 7 T REEL FG AMP
M903 LOADING MOTOR
CN607
L.M.LOAD
L.M.UNLOAD
IC605
MPC1710
LOADING MOTOR DRIVE
Q617 TAPE TOP DET
Q618 TAPE END DET
Q619 LED DRIVE
Q574-577 CURRENT LIMIT
IC501
CXA1206N
DRUM MOTOR DRIVE, AMP
IC502
JSCQ38507SD2
DRUM MOTOR DRIVE CONTROL
IC503
CX20115A
WAVE SHAPER
DRUM MOTOR
M901 DRUM MOTOR
FG
PG
CN581
DRUM V
DRUM U
DRUM W
DRUM COM
SENS GND
D PG
FG/PG COM
D FG
SENS GND


8
9
10
11
12
13
14
15
16
17
18
19
20
IC602 S-81350AG REG
IC603 TL7757 RESET
IC601 CXP80116 SYSTEM CONTROL SERVO
FP-181 FLEXIBLE CN605
BATT SENSE
MOTOR GND
CAP FG
CAP VS
DRUM VS
CAP ERROR
DRUM ERROR
CAM UNREG
VTR UNREG
UNK(VTR ON)
REG GND
REG 5V
VIDEO 5V
EVF 5V
Q611 PB RF AMP
Q623 SWITCH
Q643 SWITCH
Q644 SWITCH
Q645 INVERTER
Q681,682 5VREG
Q684 LIMITER
Q683 LIMITER
Q571,572 CORRELATION LIMIT DETECTOR
Q573 LIMITER
IC604 μPC324G2 CAP PWM LPF
Q574-576,578 CURRENT LIMIT DET
Q577 CURRENT LIMITER
Q501 COMP
IC607 μPC393G2 CLOG DET CUE/REV, SP/LP DET
Q664 INVERTER
Q665 INVERTER
IC505 CXA1204Q ATF SERVO
IC504 CXA1127M CAPSTAN MOTOR DRIVE
Q541 PB RF BUFFER
FP-182 FLEXIBLE
CAPSTAN MOTOR
M902 CAPSTAN MOTOR
CAP FG
no mark : REC/PB mode
( ) : REC mode
〈 〉 : PB mode
* : can not be measured
VS-2


5
6
7
8
9
10
11
12
13
14
15
16
Q601-610
MATRIX SWITCH
IC602 (C-13)
S-81350AG REG
IC603 (C-14)
TL7757 RESET
IC601
CXP80116
SYSTEM CONTROL SERVO
Q612, 613
WAKE UP
Q614-616
DEW DET
Q617
TAPE TOP DET
Q618
TAPE END DET
Q619
LED DRIVE
Q681, 682
5V REG
Q684
LIMITER
Q683
LIMITER
Q571, 572
CORRELATION LIMIT DETECTOR
Q573
LIMITER
IC604
μPC324G2
CAP PWM LPF
Q574-576, 578
CURRENT LIMIT DET
Q577
CURRENT LIMITER
IC505
CXA1204Q
ATF SERVO
IC504
CXA1127M
CAPSTAN MOTOR DRIVE
IC503
CX20115A
WAVE SHAPER
IC502
JSC038507S02
DRUM MOTOR DRIVE CONTROL
Q541
PB RF BUFFER
CAPSTAN MOTOR
M902
CAPSTAN MOTOR
CAP FG
M901
DRUM MOTOR
FP-182 FLEXIBLE
RV601
DRUM M.H ADJ
RV602
SW POS ADJ


15
16
17
18
19
20
21
22
23
24
25
26
27
FP-181 FLEXIBLE CN605
CN2
VO11 (EVF 5V)
VO12 (VIDEO 5V)
VO13 (REG 5V)
GND VI (REG GND)
GND VI (REG GND)
VC11 (UN (VIR ON))
VC21 (UN (CAM ON))
VO4 (VTR UNREG)
VO5 (CAM UNREG)
VC32 (DRUM ERROR)
VC31 (CAP ERROR)
VO32 (DRUM VS)
VO31 (CAP VS)
F831 (CAP FB)
GND V3 (MOTOR GND)
GND V3 (MOTOR GND)
BATT SENSE (RVOUT)
DC/DC CONV.
TO VC-60 BOARD W801
FP-186 FLEXIBLE CN801
(See Page 133)
CN3
VO21 (23V)
VO22 (15V)
VO23 (-9V)
VO24 (CAM 5V)
GND VO3 (CAM GND)
GND VO3 (CAM GND)
GND VO6 (AF GND)
VO6 (AF UNREG)
TO VS-22 BOARD (1/3) (RP,TE)
(See Page 159)
CN1
VI21 (CAM UNREG)
VI31 (MOTOR UNREG)
VI11 (VTR UNREG)
GND VI (UNREG GND)
GND VI (UNREG GND)
BATTERY TERMINAL
CN901
CAM UNREG
MOTOR UNREG
VIR UNREG
UNREG GND
UNREG GND
F901 (1.6A)
F902 (1.6A)
F903 (1.6A)
BATTERY
TO VS-22 BOARD (2/3) (VIDEO)
(See Page 171)
Q623 (B-9) SWITCH
Q643 (E-16) SWITCH
Q644 (F-16) SWITCH
Q645 (F-17) INVERTER
Q611 PB RF AMP
(F-17) Q664 INVERTER
(F-17) Q665 INVERTER
IC607 ①②③ CLOG DET ⑤⑥⑦ CUE/REV. SP/LP DET
μPC393G2
IC505 (D-19)
CXA1204Q ATF SERVO
Q661 (G-11) PB RF
Q662 (F-12) LPF
Q663 (G-12) LPF
Q542 (F-10) REC ATF RF
Q543 (F-11) REC ATF RF
Q541 (F-18) PB RF BUFFER
FP-184 FLEXIBLE
TO VC-60 BOARD CN802
(See Page 134)
CAPSTAN MOTOR
CAP FG

no mark : REC/PB mode
( ) : REC mode
〈 〉 : PB mode
✻ : can not be measured

VS-22 BOARD (3/3)(SS)

- Signal path

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷·	
Drum servo (speed and phase)		▷‐‐	
Capstan speed servo			
Capstan phase servo			⊃⟩
Capstan servo (speed and phase)		➡⟩⟩	
Ref. signal	▶		⊃

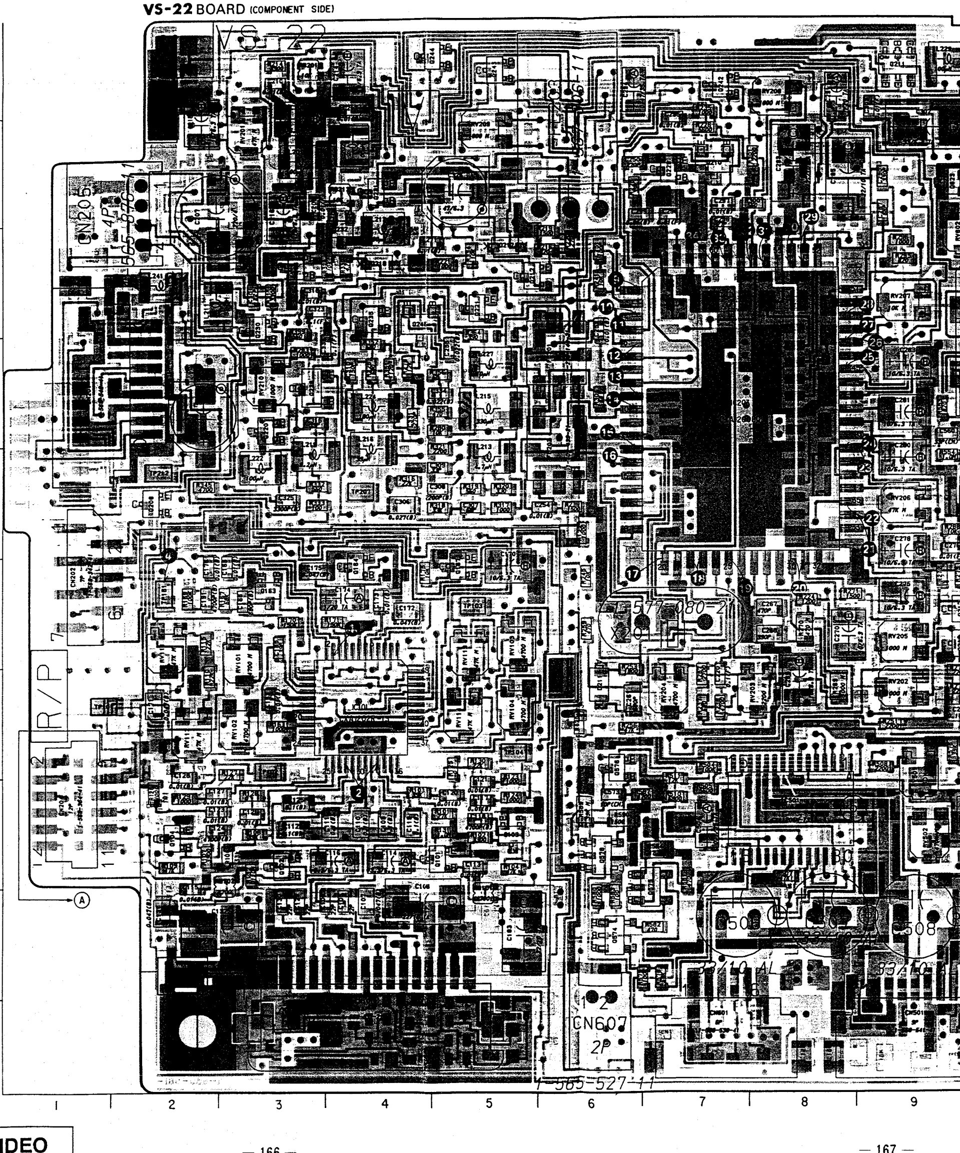
VS-22 (HEAD AMP, VIDEO, SERVO/SYSTEM CONTROL) PRINTED WIRING BOARDS

— Ref. No. VS-22 BOARD: 5000 series —

- **For printed wiring boards.**
- VS-22 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

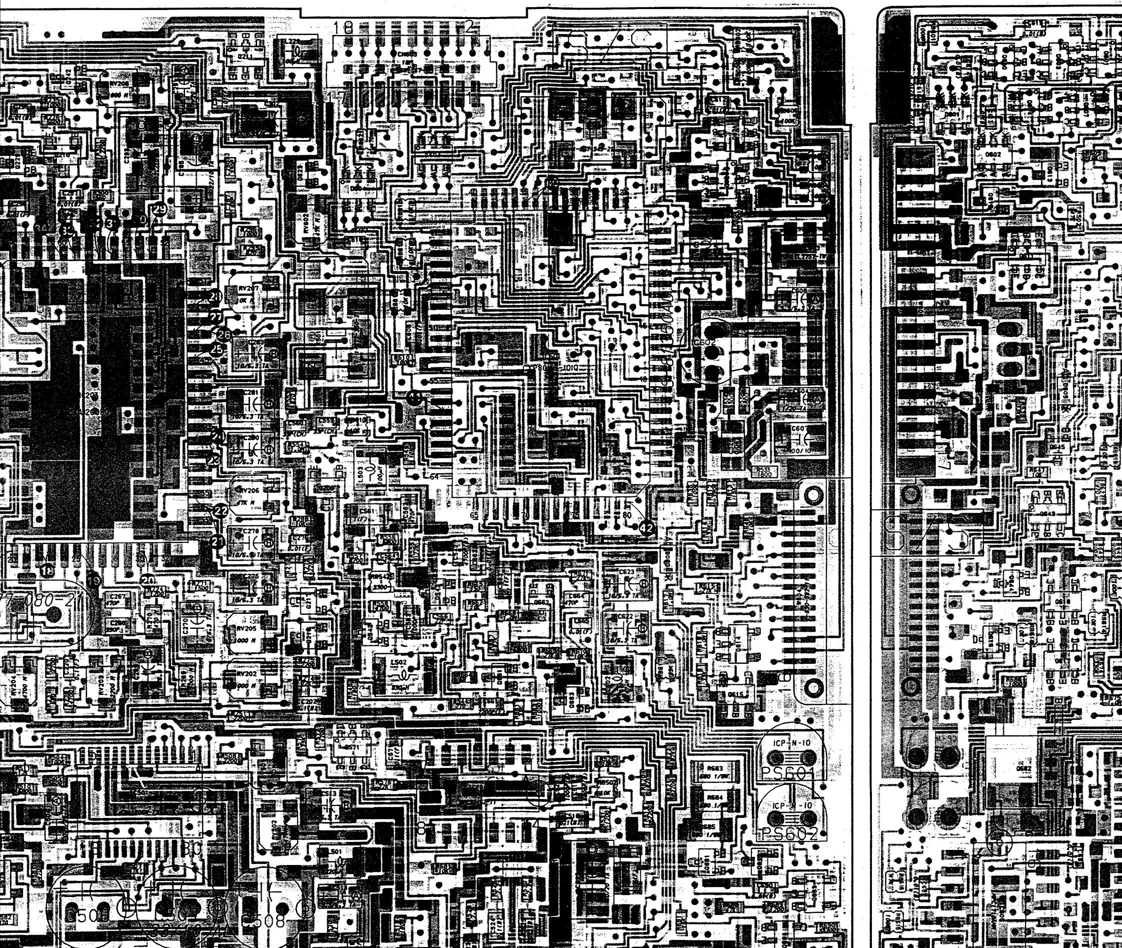
Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.

VS-22 BOARD (COMPONENT SIDE)



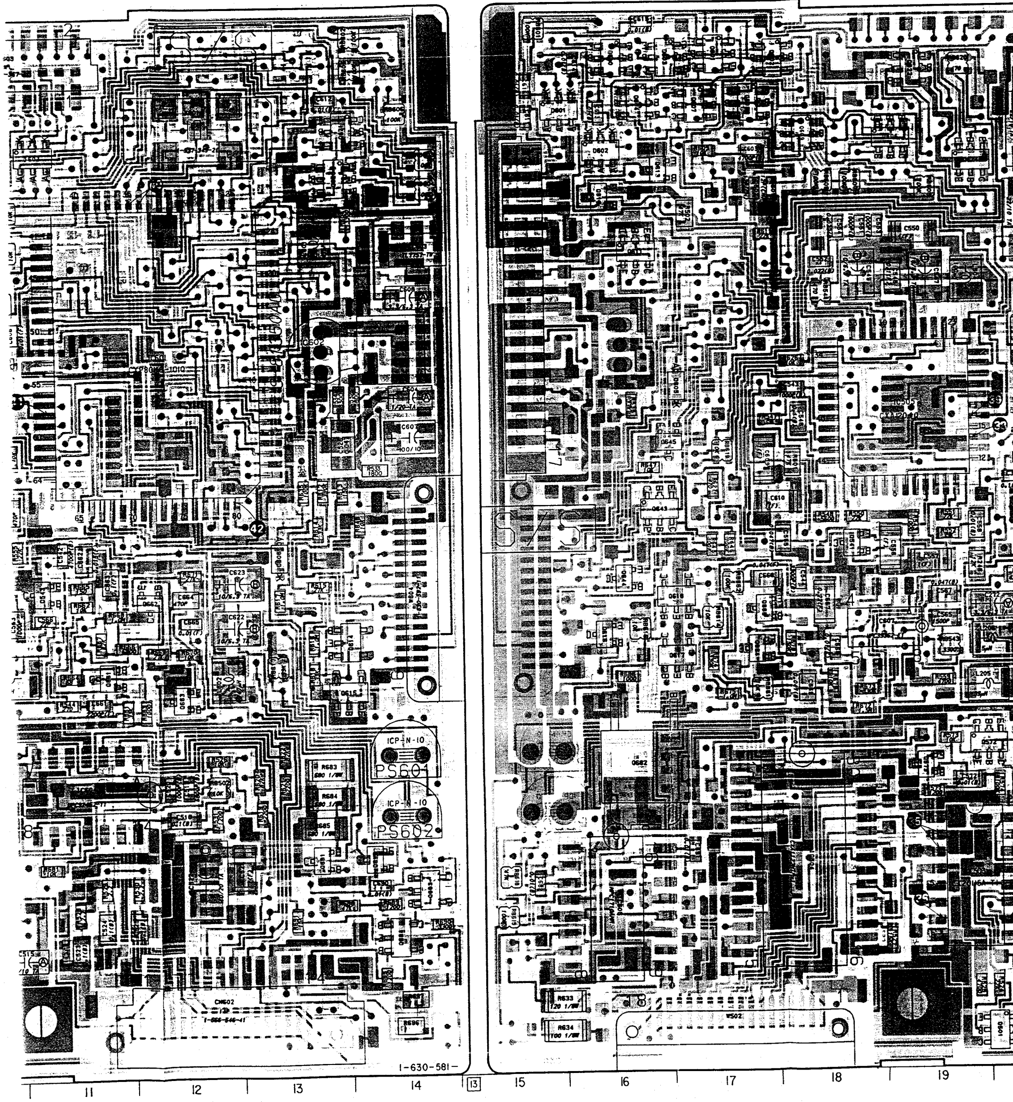
VS-22
CN205 4P
1-565-876-11
CN202
R/P
CN607 2P
1-577-080-21
1-565-527-11
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9

VS-22 BOARD (CONDUCTOR SIDE)

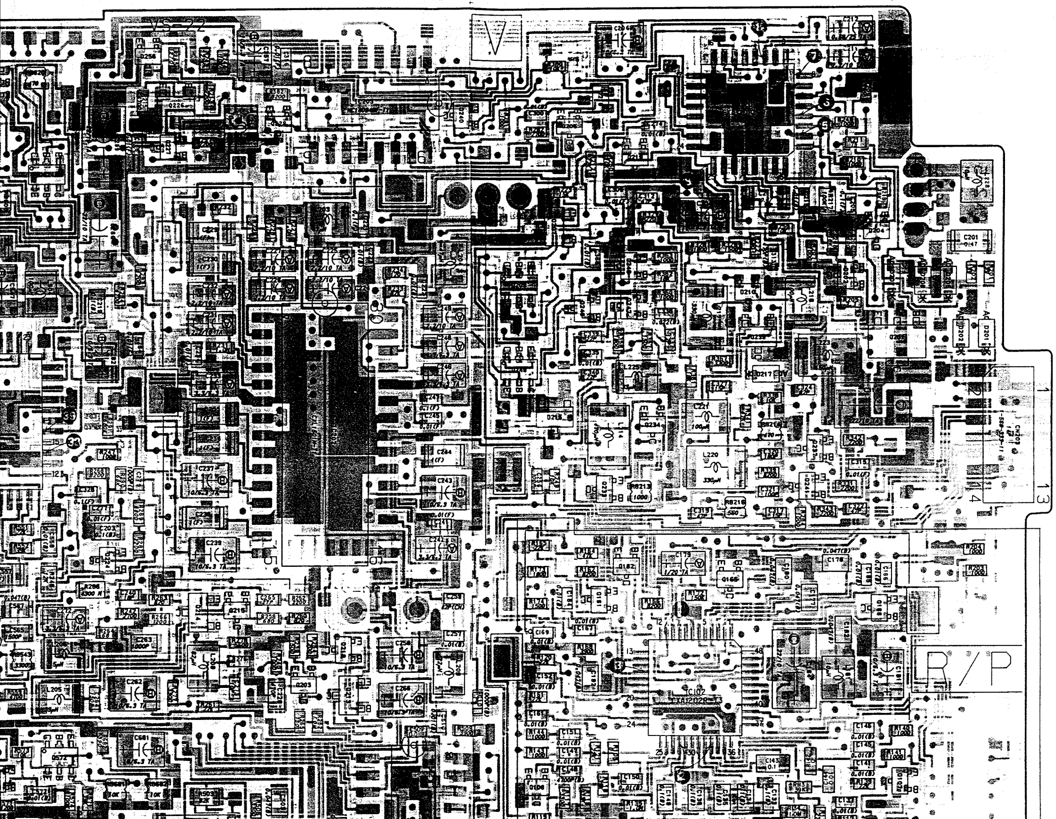

18
2
CXP80424-101Q
RV207
RV206
RV205
RV202
RV203
RV204
C602
C601
C278
C280
C281
L502
L503
ICP-N-10
PS601
ICP-N-10
PS602
R683
R684
C506
C507
C508
33/10
CN602
CN501
CN601
1-630-581-
7
8
9
10
11
12
13
14
13
15
16
17

VIDEO **VIDEO**

VS-22 BOARD (CONDUCTOR SIDE)


PS601
ICP-N-10
PS602
1-630-581-
CN602
W502
11
12
13
14
13
15
16
17
18
19

VIDEO **VIDEO**


V
R/P
IC102
CXA1202R
D502
D501
C201
0.47
L220
330μH
C239
C505
0.022(B)
R585
100 1/8W
1-630-581-
13
A
19
20
21
22
23
24
25
26
27
28

VIDEO **VIDEO**

UDIO), MA-32 (MIC AMP), EL-1 (REMOTE/EARPHONE JACK) PRINTED WIRING BOARDS

U-51 BOARD: 3000 series, MA-32 BOARD: 4000 series, EL-1 BOARD: 5000 series —

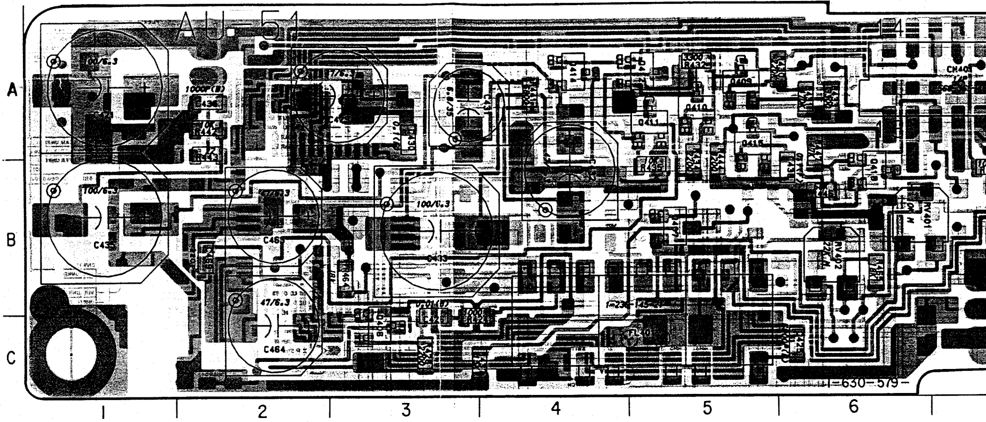
ted wiring boards.

A-32 and EL-1 boards is the printed wiring board four layers structure but inner two layers' patterns are

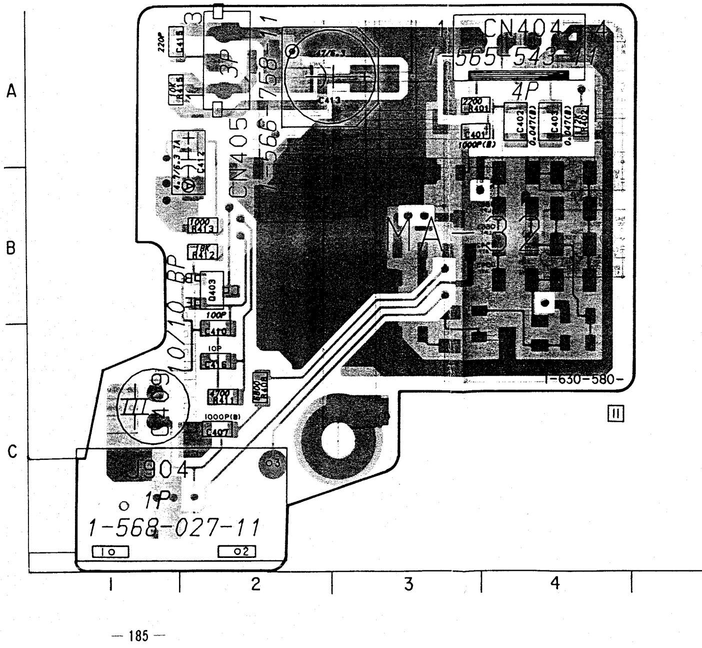
ole (⊗) is omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.

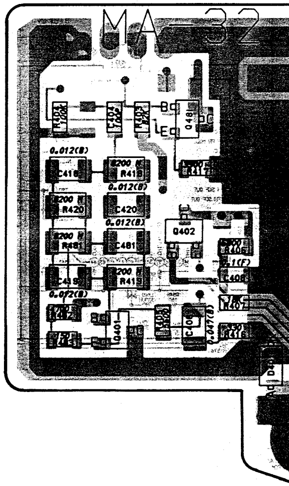
AU-51 BOARD (COMPONENT SIDE)


AU-51
A
B
C
1
2
3
4
5
6
100/6.3
1000P(B)
C436
C435
47/6.3
C464
C461
100/6.3
C433
1-630-579-

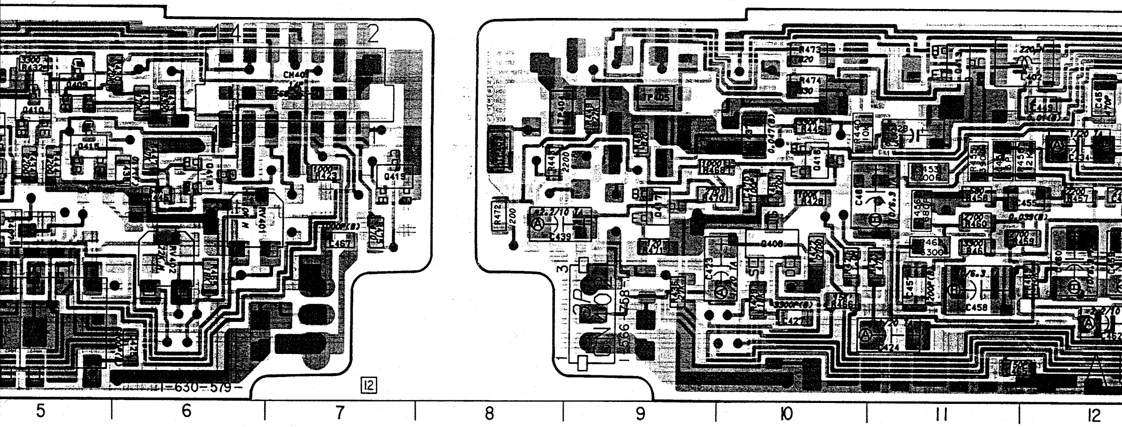
MA-32 BOARD (COMPONENT SIDE)


A
B
C
1
2
3
4
CN404 4
1-565-543-11
4P
CN405
1-566-758-11
3P
C413
C415
C412
R413
R412
Q403
C410
C416
R411
R408
C407
C409
10/10 BP
1000P(B)
J904
1P
1-568-027-11
MA-32
1-630-580-
II
R401
C401
C402
C403
R402
2700
1000P(B)
0.047(B)

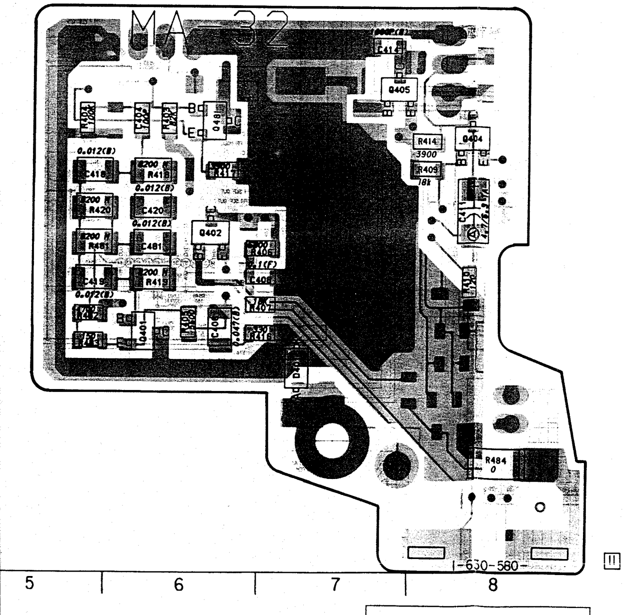
MA-32 BOARD (CONDUCTOR SIDE)


MA-32
R404
C404
R403
Q481
0.012(B)
C418
R418
R420
C420
Q402
R481
C481
C419
R419
Q401
0.047(B)
5
6

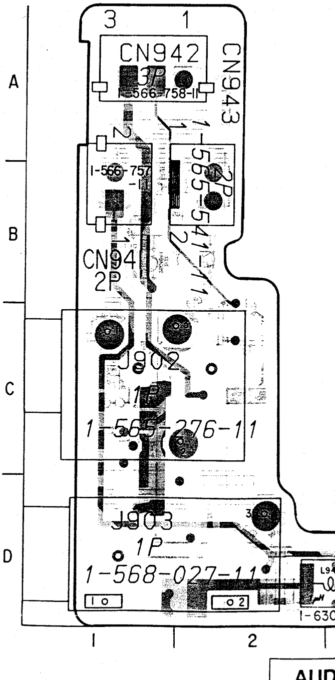
AU-51 BOARD (CONDUCTOR SIDE)


CN401
Q409
Q410
Q415
Q419
C467
R473
R474
R472
C439
Q408
Q416
C458
C423
C424
C427
1-630-579-
12
5
6
7
8
9
10
11
12

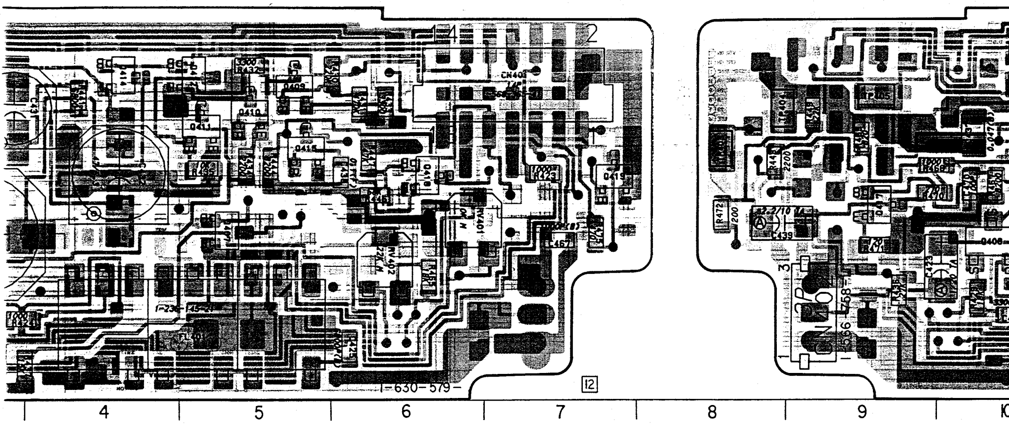
MA-32 BOARD (CONDUCTOR SIDE)


MA-32
C414
Q405
Q404
R414
3900
R409
18k
Q402
Q401
R484
0
1-630-580-
11
5
6
7
8

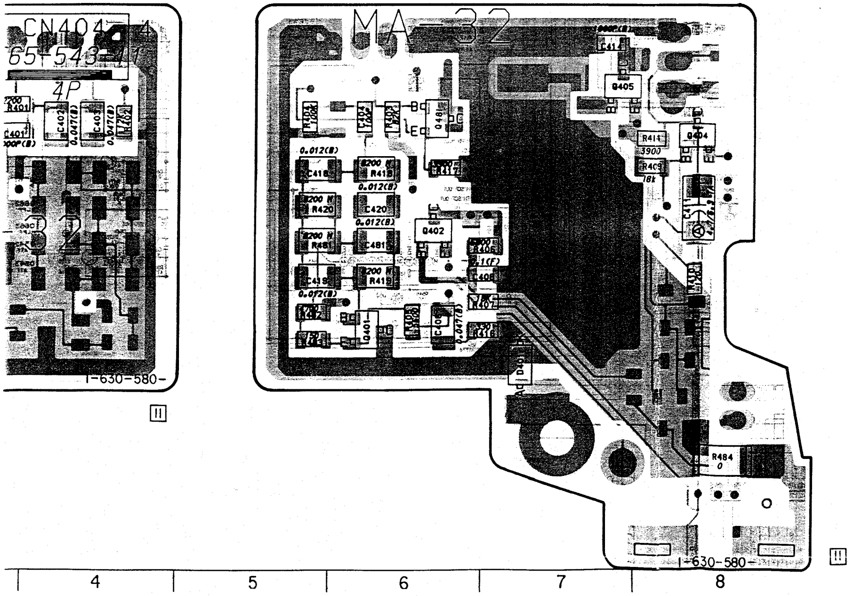
EL-1 BOARD (COMPONENT SIDE)


CN942
3P
1-566-758-11
CN943
1-565-541-11
2P
1-566-757-11
CN941
2P
J902
1P
1-565-276-11
J903
1P
1-568-027-11
1-630
A
B
C
D
1
2

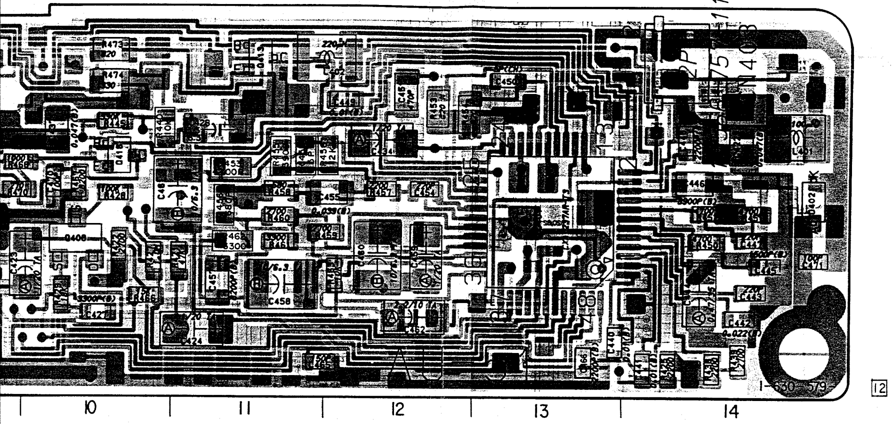
AU-51 BOARD (CONDUCTOR SIDE)


CN401
Q409
Q410
Q411
Q415
Q419
RV401
RV402
R423
C467
R432
1-630-579-
12
4
5
6
7
8
9

MA-32 BOARD (CONDUCTOR SIDE)

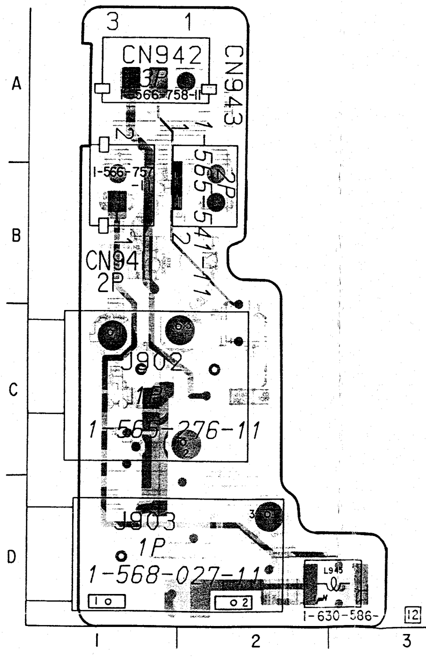

CN404
4P
R401
C401
C402
C403
1-630-580-
11
MA-32
Q405
Q404
R411
3900
R409
18k
C411
Q481
Q402
Q401
C418
R418
R420
C420
R481
C481
C419
R419
D401
R484
0
1-630-580-
11
4
5
6
7
8

R SIDE)



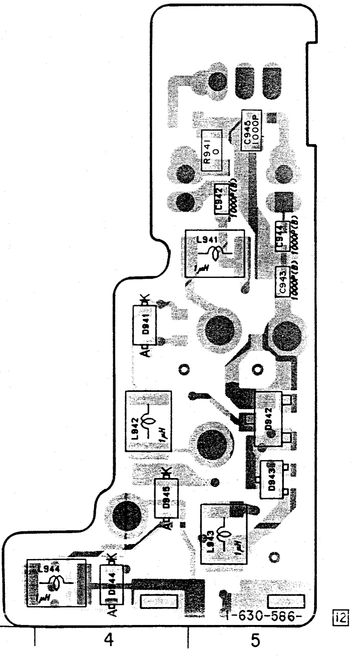
R473
R474
D410
Q408
C423
C424
C458
C459
C462
C446
C440
C442
1-630-579-
12
10
11
12
13
14

EL-1 BOARD (COMPONENT SIDE)



3
1
CN942
3P
1-566-758-11
CN943
1-565-541-11
2P
1-566-757-11
CN941
2P
J902
1P
1-565-276-11
J903
1P
1-568-027-11
L945
1-630-586-
12
A
B
C
D
1
2
3

EL-1 BOARD (CONDUCTOR SIDE)

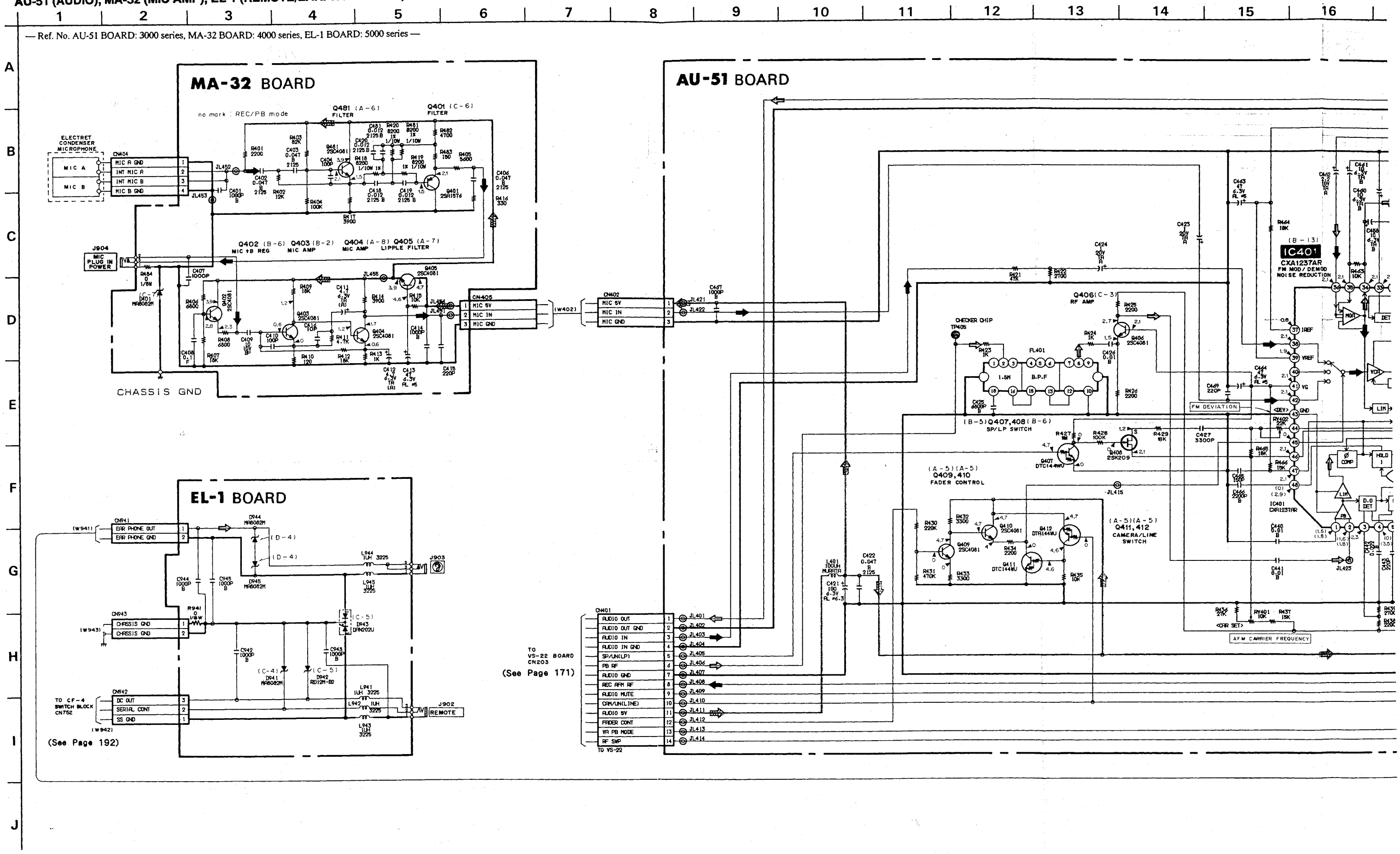


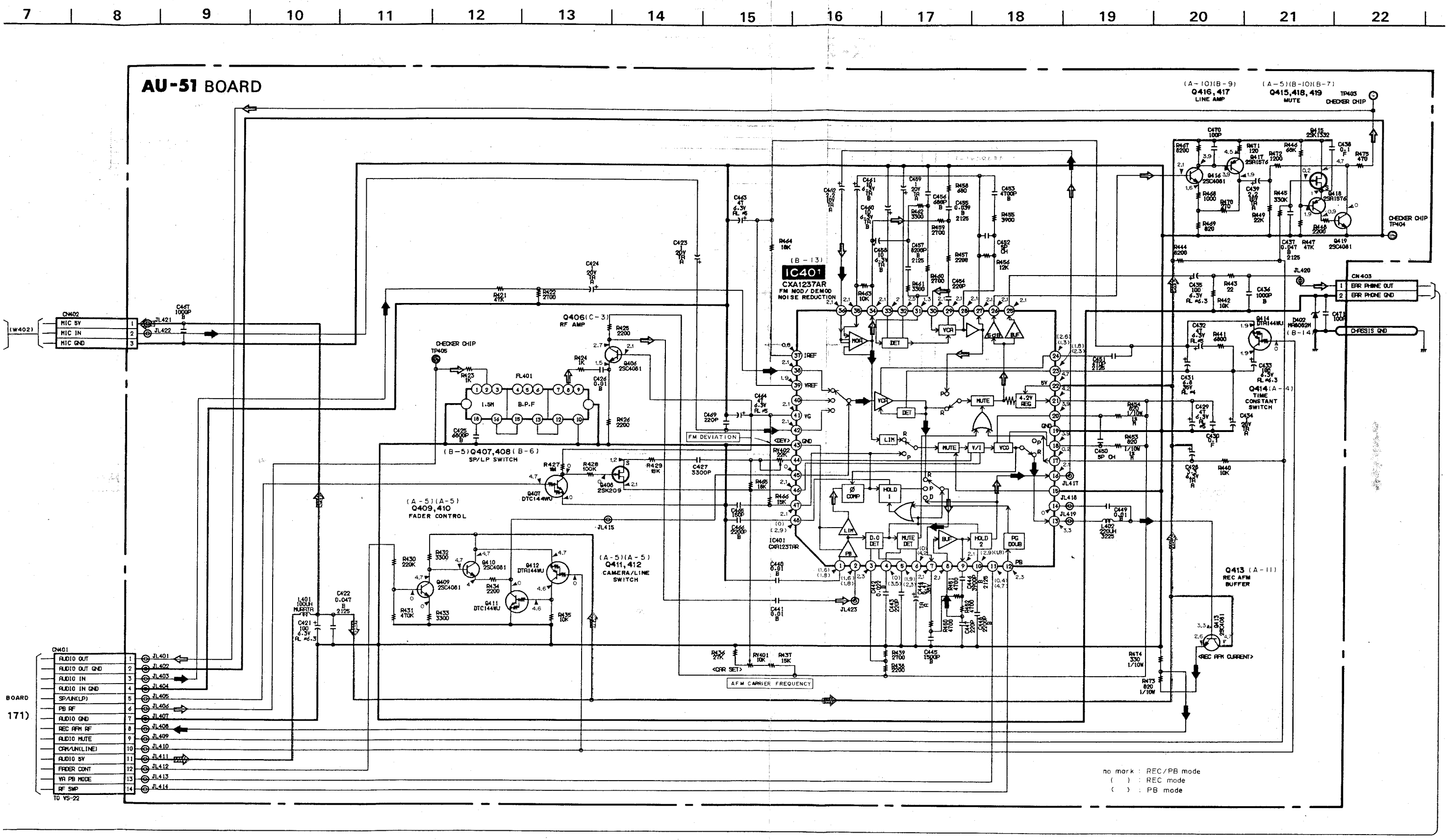
R941
C945
1000P
C942
1000P(B)
L941
1μH
C944
1000P(B)
C943
1000P(B)
D941
L942
1μH
D942
D943
D945
L943
1μH
L944
1μH
D944
1-630-586-
12
4
5

AUDIO **AUDIO**

AU-51 (AUDIO), MA-32 (MIC AMP), EL-1 (REMOTE/EARPHONE JACK) SCHEMATIC DIAGRAMS

— Ref. No. AU-51 BOARD: 3000 series, MA-32 BOARD: 4000 series, EL-1 BOARD: 5000 series —


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
MA-32 BOARD
no mark : REC/PB mode
Q481 (A-6) FILTER
Q401 (C-6) FILTER
ELECTRET CONDENSER MICROPHONE
MIC A
MIC B
CN404
MIC A GND
INT MIC A
INT MIC B
MIC B GND
JL452
JL453
J904
MIC PLUG IN POWER
Q402 (B-6) MIC +B REG
Q403 (B-2) MIC AMP
Q404 (A-8) MIC AMP
Q405 (A-7) LIPPLE FILTER
D401 MA8082M
CN405
MIC 5V
MIC IN
MIC GND
(W402)
CHASSIS GND
EL-1 BOARD
CN941
EAR PHONE OUT
EAR PHONE GND
(W941)
D944 MA8082M
D945 MA8082M
L944 1UH 3225
L945 1UH 3225
J903
CN943
CHASSIS GND
CHASSIS GND
(W943)
D943 DAN202U
D941 MA8082M
D942 RD12M-B2
L941 1UH 3225
L942 1UH 3225
L943 1UH 3225
J902
REMOTE
CN942
DC OUT
SERIAL CONT
SS GND
TO CF-4 SWITCH BLOCK CN752
(W942)
(See Page 192)
AU-51 BOARD
CN402
MIC 5V
MIC IN
MIC GND
JL421
JL422
CN401
AUDIO OUT
AUDIO OUT GND
AUDIO IN
AUDIO IN GND
SP/LN(LP)
PB RF
AUDIO GND
REC AFM RF
AUDIO MUTE
CAM/LN(LINE)
AUDIO 5V
FADER CONT
VR PB MODE
RF SWP
TO VS-22
TO VS-22 BOARD CN203
(See Page 171)
JL401
JL402
JL403
JL404
JL405
JL406
JL407
JL408
JL409
JL410
JL411
JL412
JL413
JL414
L401 100UH MURATA
C421 100 6.3V AL #6.3
C422 0.047 B 2125
CHECKER CHIP TP405
FL401
B.P.F
Q406 (C-3) RF AMP
(B-5) Q407, 408 (B-6) SP/LP SWITCH
Q407 DTC144WU
Q408 2SK209
(A-5)(A-5) Q409, 410 FADER CONTROL
Q409 2SC4081
Q410 2SC4081
Q411 DTC144WU
Q412 DTA144WU
(A-5)(A-5) Q411, 412 CAMERA/LINE SWITCH
JL415
(B-13)
IC401
CXA1237AR
FM MOD/DEMOD NOISE REDUCTION
IREF
VREF
VG
GND
FM DEVIATION
AFM CARRIER FREQUENCY
CAR SET
RV401 10K
RV402 22K
IC401 CXA1237AR
JL423
LIM
PB
D.O DET
HOLD
COMP
DET
MOD
VCO

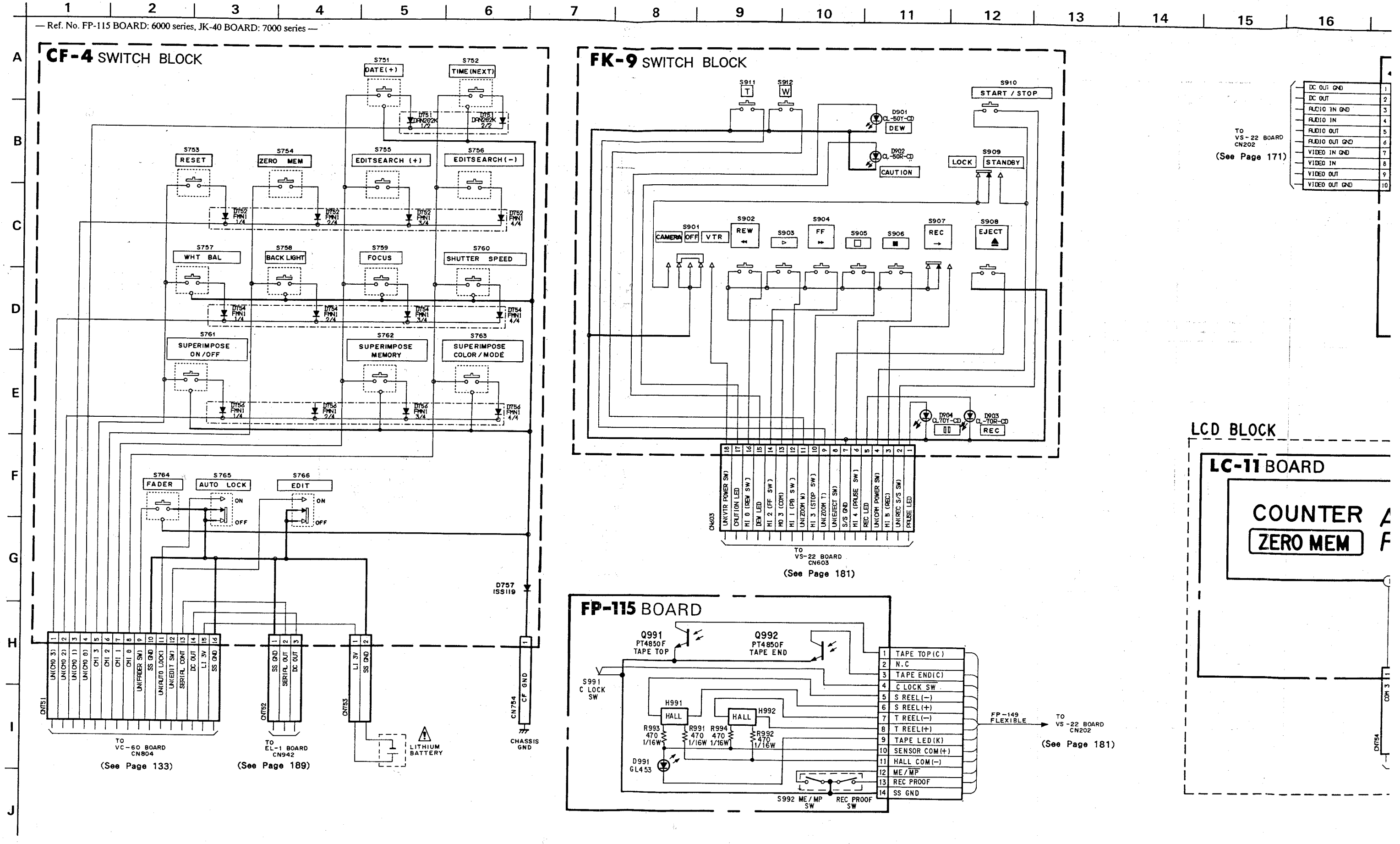

7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
AU-51 BOARD
IC401
CXA1237AR
FM MOD/DEMOD NOISE REDUCTION
Q406 (C-3) RF AMP
(B-5) Q407,408 (B-6) SP/LP SWITCH
(A-5)(A-5) Q409,410 FADER CONTROL
(A-5)(A-5) Q411,412 CAMERA/LINE SWITCH
(A-10)(B-9) Q416,417 LINE AMP
(A-5)(B-10)(B-7) Q415,418,419 MUTE
Q414 (A-4) TIME CONSTANT SWITCH
Q413 (A-11) REC AFM BUFFER
FL401 1.5M B.P.F
CHECKER CHIP TP405
CHECKER CHIP TP403
CHECKER CHIP TP404
FM DEVIATION
AFM CARRIER FREQUENCY
<CAR SET>
<DEV>
<REC AFM CURRENT>
CN402
MIC 5V
MIC IN
MIC GND
(W402)
CN401
AUDIO OUT
AUDIO OUT GND
AUDIO IN
AUDIO IN GND
SP/LP(LP)
PB RF
AUDIO GND
REC AFM RF
AUDIO MUTE
CAM/LINE(LINE)
AUDIO 5V
FADER CONT
VA PB MODE
RF SWP
TO VS-22
BOARD
171)
CN403
EAR PHONE OUT
EAR PHONE GND
CHASSIS GND
D402 MA8062M (B-14)
NOR
DET
VCA
LIM
MUTE
V/I
VCO
HOLD 1
HOLD 2
D.O DET
MUTE DET
Ø COMP
PG DOUB
BUF
4.2V REG
IREF
VREF
VG
GND
no mark : REC/PB mode
( ) : REC mode
〈 〉 : PB mode

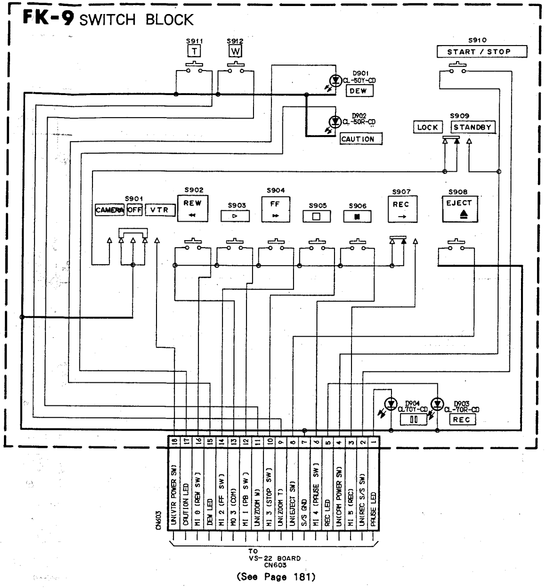
- Signal path

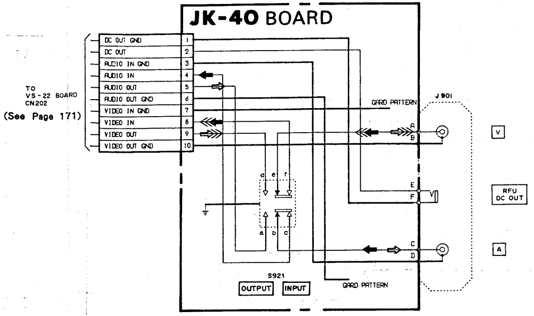
	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC				➡
PB				⇨

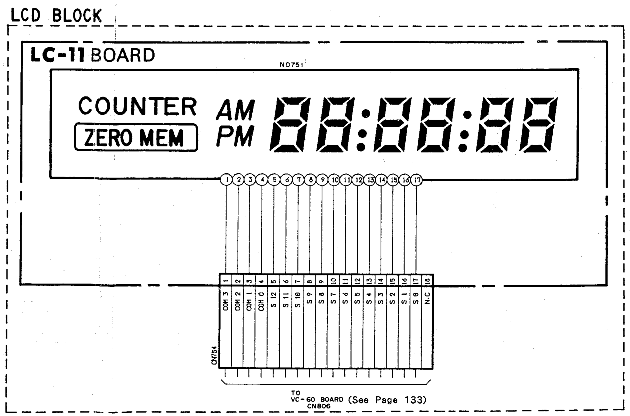
CF-4 (CAMERA FUNCTION SWITCH), FK-9 (VTR FUNCTION SWITCH), JK-40 (VIDEO/AUDIO INPUT/OUTPUT), LC-11 (LIQUID CRYSTAL DISPLAY), FP-115 (TAPE TOP/END SENSOR/TAPE SELECT) SCHEMATIC DIAGRAMS

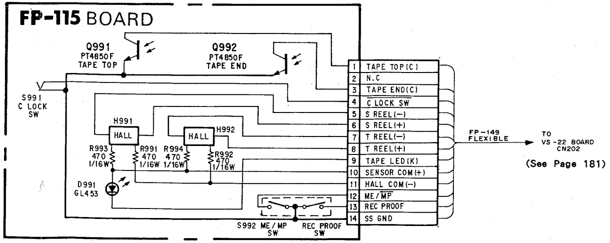
— Ref. No. FP-115 BOARD: 6000 series, JK-40 BOARD: 7000 series —


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
CF-4 SWITCH BLOCK
S751
DATE(+)
S752
TIME (NEXT)
D751 DAN202K 1/2
D751 DAN202K 2/2
S753
RESET
S754
ZERO MEM
S755
EDITSEARCH (+)
S756
EDITSEARCH (−)
D752 FMN1 1/4
D752 FMN1 2/4
D752 FMN1 3/4
D752 FMN1 4/4
S757
WHT BAL
S758
BACK LIGHT
S759
FOCUS
S760
SHUTTER SPEED
D754 FMN1 1/4
D754 FMN1 2/4
D754 FMN1 3/4
D754 FMN1 4/4
S761
SUPERIMPOSE ON/OFF
S762
SUPERIMPOSE MEMORY
S763
SUPERIMPOSE COLOR/MODE
D756 FMN1 1/4
D756 FMN1 2/4
D756 FMN1 3/4
D756 FMN1 4/4
S764
FADER
S765
AUTO LOCK
S766
EDIT
ON
OFF
ON
OFF
D757
1SS119
CN751
1 UN(CMO 3)
2 UN(CMO 2)
3 UN(CMO 1)
4 UN(CMO 0)
5 CMI 3
6 CMI 2
7 CMI 1
8 CMI 0
9 UN(FADER SW)
10 SS GND
11 UN(AUTO LOCK)
12 UN(EDIT SW)
13 SERIAL CONT
14 DC OUT
15 LI 3V
16 SS GND
TO VC-60 BOARD CN804
(See Page 133)
CN752
1 SS GND
2 SERIAL OUT
3 DC OUT
TO EL-1 BOARD CN942
(See Page 189)
CN753
1 LI 3V
2 SS GND
LITHIUM BATTERY
CN754
1 CF GND
CHASSIS GND
FK-9 SWITCH BLOCK
S911
T
S912
W
S910
START / STOP
D901
CL-50Y-CD
DEW
D902
CL-50R-CD
CAUTION
LOCK
S909
STANDBY
S901
CAMERA
OFF
VTR
S902
REW ◀◀
S903
▷
S904
FF ▶▶
S905
□
S906
■
S907
REC →
S908
EJECT ⏏
D904
CL70Y-CD
D903
CL-70R-CD
REC
CN603
18 UN(VTR POWER SW)
17 CAUTION LED
16 MI 0 (REW SW)
15 DEW LED
14 MI 2 (FF SW)
13 MO 3 (COM)
12 MI 1 (PB SW)
11 UN(ZOOM W)
10 MI 3 (STOP SW)
9 UN(ZOOM T)
8 UN(EJECT SW)
7 S/S GND
6 MI 4 (PAUSE SW)
5 REC LED
4 UN(CAM POWER SW)
3 MI 5 (REC)
2 UN(REC S/S SW)
1 PAUSE LED
TO VS-22 BOARD CN603
(See Page 181)
FP-115 BOARD
Q991
PT4850F
TAPE TOP
Q992
PT4850F
TAPE END
S991
C LOCK SW
H991
HALL
H992
HALL
R993 470 1/16W
R991 470 1/16W
R994 470 1/16W
R992 470 1/16W
D991
GL453
S992 ME/MP SW
REC PROOF SW
1 TAPE TOP(C)
2 N.C
3 TAPE END(C)
4 C LOCK SW
5 S REEL(−)
6 S REEL(+)
7 T REEL(−)
8 T REEL(+)
9 TAPE LED(K)
10 SENSOR COM(+)
11 HALL COM(−)
12 ME/MP
13 REC PROOF
14 SS GND
FP-149 FLEXIBLE
TO VS-22 BOARD CN202
(See Page 181)
TO VS-22 BOARD CN202
(See Page 171)
DC OUT GND 1
DC OUT 2
AUDIO IN GND 3
AUDIO IN 4
AUDIO OUT 5
AUDIO OUT GND 6
VIDEO IN GND 7
VIDEO IN 8
VIDEO OUT 9
VIDEO OUT GND 10
LCD BLOCK
LC-11 BOARD
COUNTER
ZERO MEM
CN3
CN754


FK-9 SWITCH BLOCK
S911 T
S912 W
S910 START / STOP
D901 CL-50Y-CD DEW
D902 CL-50R-CD CAUTION
LOCK
S909 STANDBY
S901 CAMERA OFF VTR
S902 REW
S903
S904 FF
S905
S906
S907 REC
S908 EJECT
D904 CL-70Y-CD
D903 CL-70R-CD REC
CN603
18 UN(VTR POWER SW)
17 CAUTION LED
16 MI 0 (REW SW)
15 DEW LED
14 MI 2 (FF SW)
13 MO 3 (COM)
12 MI 1 (PB SW)
11 UN(ZOOM W)
10 MI 3 (STOP SW)
9 UN(ZOOM T)
8 UN(EJECT SW)
7 S/S GND
6 MI 4 (PAUSE SW)
5 REC LED
4 UN(CAM POWER SW)
3 MI 5 (REC)
2 UN(REC S/S SW)
1 PAUSE LED
TO VS-22 BOARD CN603
(See Page 181)


JK-40 BOARD
TO VS-22 BOARD CN202
(See Page 171)
1 DC OUT GND
2 DC OUT
3 AUDIO IN GND
4 AUDIO IN
5 AUDIO OUT
6 AUDIO OUT GND
7 VIDEO IN GND
8 VIDEO IN
9 VIDEO OUT
10 VIDEO OUT GND
GARD PATTERN
J901
A
B
E
F
C
D
V
RFU DC OUT
A
a e f
a b c
S921
OUTPUT
INPUT
GARD PATTERN


LCD BLOCK
LC-11 BOARD
ND751
COUNTER
ZERO MEM
AM
PM
88:88:88
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯ ⑰
CN754
1 COM 3
2 COM 2
3 COM 1
4 COM 0
5 S 12
6 S 11
7 S 10
8 S 9
9 S 8
10 S 7
11 S 6
12 S 5
13 S 4
14 S 3
15 S 2
16 S 1
17 S 0
18 N.C
TO VC-60 BOARD CN806 (See Page 133)


FP-115 BOARD
Q991 PT4850F TAPE TOP
Q992 PT4850F TAPE END
S991 C LOCK SW
H991 HALL
H992 HALL
R993 470 1/16W
R991 470 1/16W
R994 470 1/16W
R992 470 1/16W
D991 GL453
S992 ME/MP SW
REC PROOF SW
1 TAPE TOP(C)
2 N.C
3 TAPE END(C)
4 C LOCK SW
5 S REEL(−)
6 S REEL(+)
7 T REEL(−)
8 T REEL(+)
9 TAPE LED(K)
10 SENSOR COM(+)
11 HALL COM(−)
12 ME/MP
13 REC PROOF
14 SS GND
FP-149 FLEXIBLE
TO VS-22 BOARD CN202
(See Page 181)

- Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC			➡⋙	➡
PB			⇨⋙	⇨

FUNCTION SWITCH FUNCTION SWITCH

CF-4 (CAMERA FUNCTION SWITCH), FK-9 (VTR FUNCTION SWITCH), JK-40 (VIDEO/AUDIO INPUT/OUTPUT), LC-11 (LIQUID CRYSTAL DISPLAY), FP-115 (TAPE TOP/END SENSOR

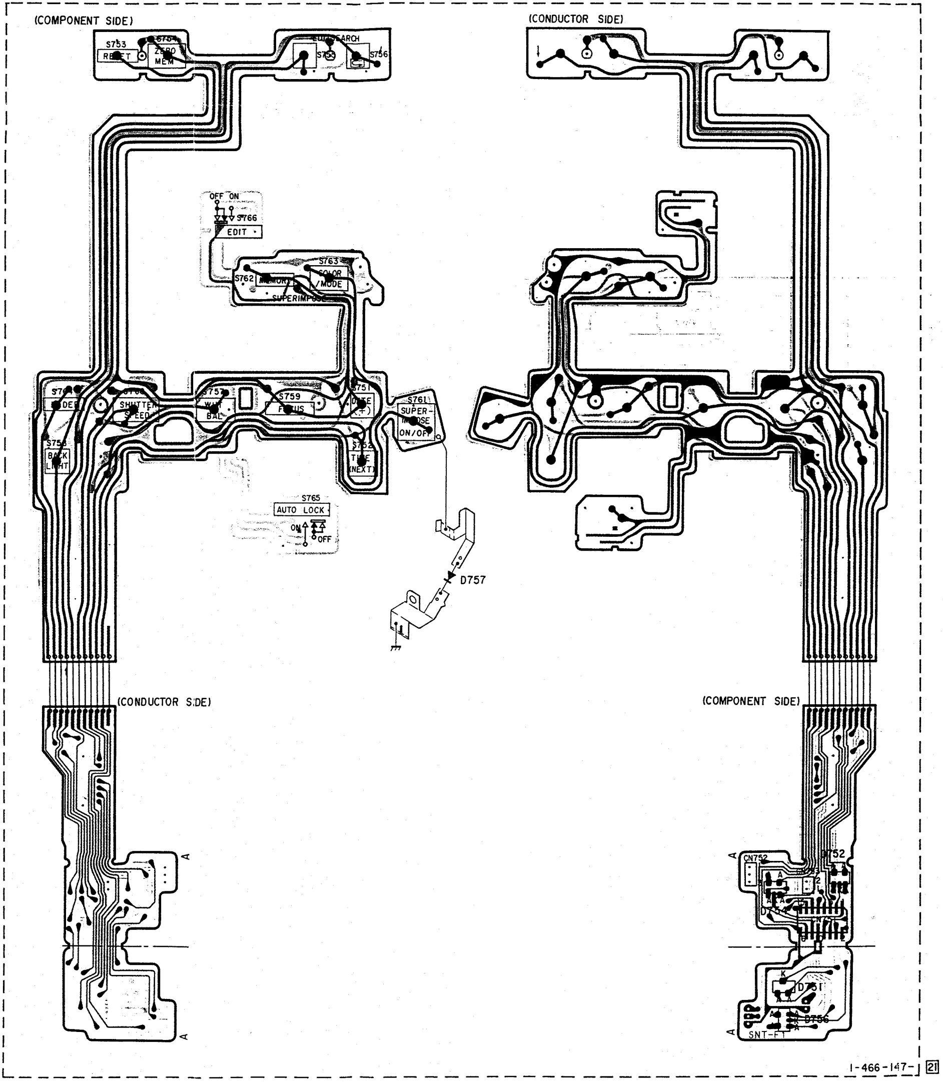
— Ref. No. FP-115 BOARD: 6000 series, JK-40 BOARD: 7000 series —

- **For printed wiring boards.**
- ⊗ : Through hole

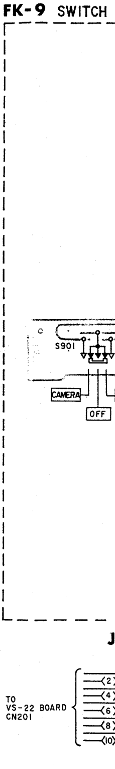
Caution:

Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.

CF-4 SWITCH BLOCK

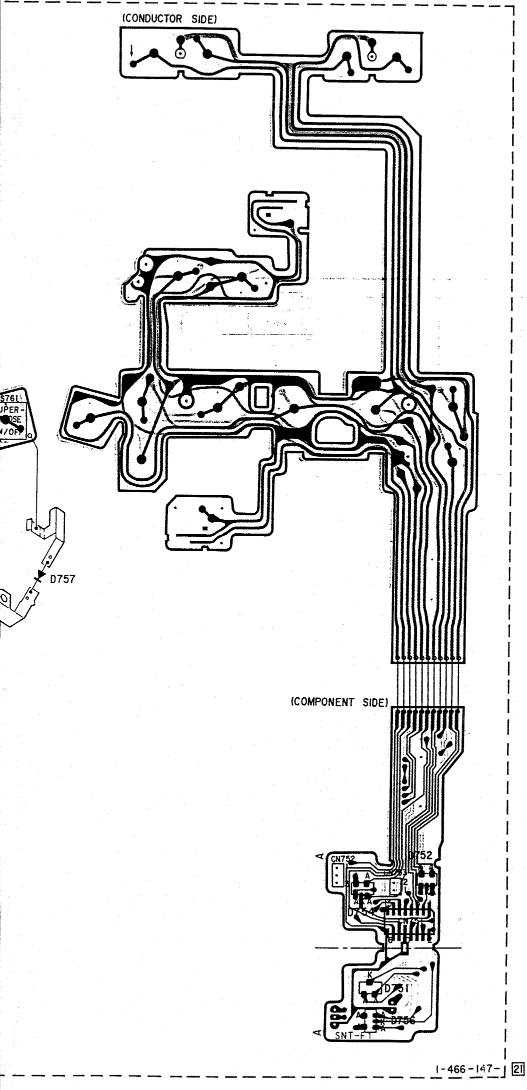

(COMPONENT SIDE)
(CONDUCTOR SIDE)
S753
RESET
S754
ZERO MEM
EDIT SEARCH
S755
S756
OFF ON
S766
EDIT
S763
COLOR /MODE
S762
MEMORY
SUPERIMPOSE
S760
MODE
S758
SHUTTER SPEED
S757
WHT BAL
S759
FOCUS
S751
DATE (+)
S761
SUPER-IMPOSE ON/OFF
S752
TIME (NEXT)
S756
BACK LIGHT
S765
AUTO LOCK
ON
OFF
D757
(CONDUCTOR SIDE)
(COMPONENT SIDE)
A
CN752
D752
D754
K
D751
D756
SNT-FT
1-466-147-
21

FK-9 SWITCH

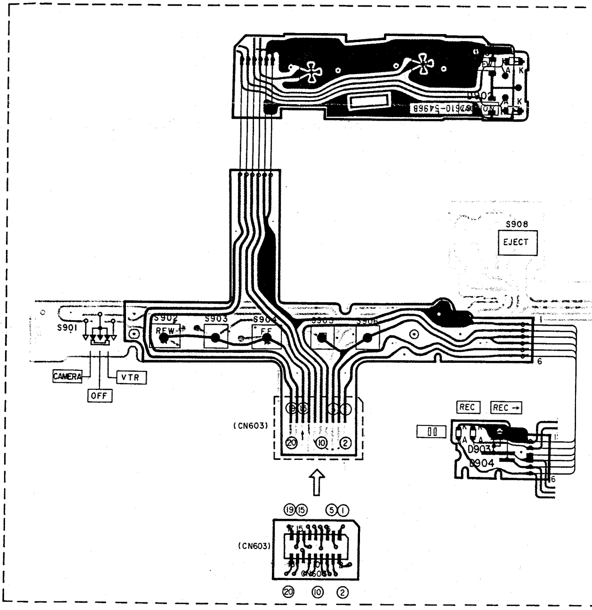

S901
CAMERA
OFF
TO VS-22 BOARD CN201
(2)
(4)
(6)
(8)
(10)

), JK-40 (VIDEO/AUDIO INPUT/OUTPUT), LC-11 (LIQUID CRYSTAL DISPLAY), FP-115 (TAPE TOP/END SENSOR/TAPE SELECT) PRINTED WIRING BOARDS

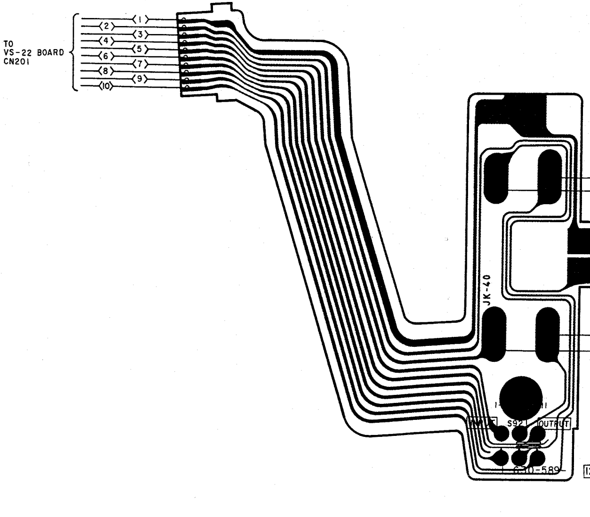
side seen from
ated.
de seen from the


(CONDUCTOR SIDE)
S761
UPER-
OSE
N/OF
D757
(COMPONENT SIDE)
CN752
D752
D751
D756
K
A
SNT-FT
1-466-147-
21

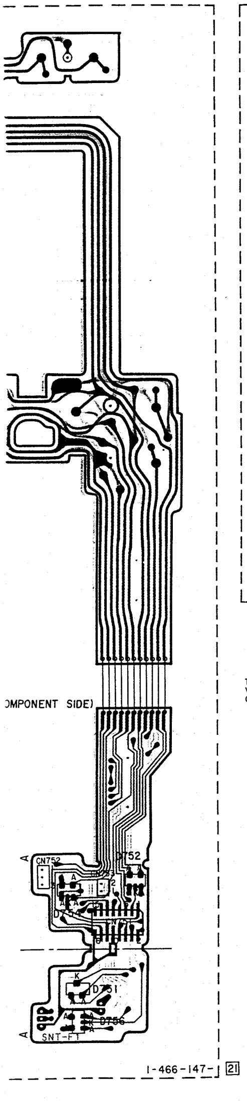
FK-9 SWITCH BLOCK


D902
1-510-5496B
S908
EJECT
S901
S902
REW
S903
S904
FF
S905
S906
CAMERA
VTR
OFF
1
6
(CN603)
⑲ ⑮ ⑤ ①
⑳ ⑩ ②
REC
REC →
D903
D904
A
K

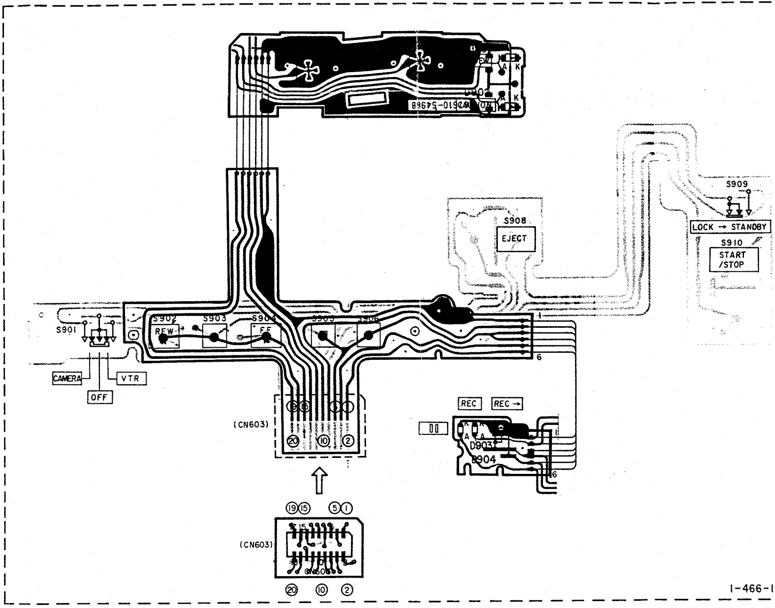
JK-40 BOARD (CONDUCTOR SIDE)


TO
VS-22 BOARD
CN201
(1)
(2)
(3)
(4)
(5)
(6)
(7)
(8)
(9)
(10)
JK-40
S921
INPUT
OUTPUT
1-630-589-

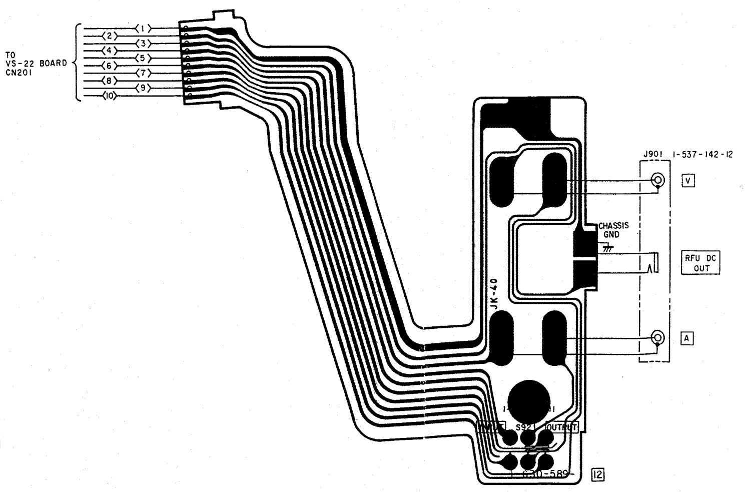
ID CRYSTAL DISPLAY), FP-115 (TAPE TOP/END SENSOR/TAPE SELECT) PRINTED WIRING BOARDS

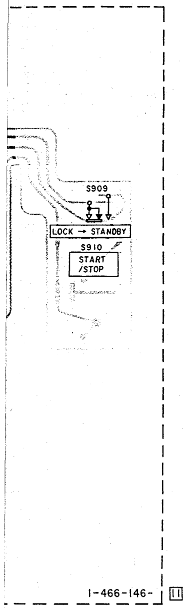

ɔMPONENT SIDE)
CN752
D752
D754
D751
D756
A
K
SNT-F1
1-466-147-
21

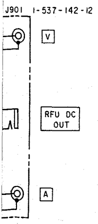
FK-9 SWITCH BLOCK


D902
A
K
S901
CAMERA
OFF
VTR
S902
REW
S903
S904
FF
S905
S906
1
6
(CN603)
19 15
5 1
20 10 2
S908
EJECT
S909
LOCK → STANDBY
S910
START /STOP
REC
REC →
D903
D904
1-466-1

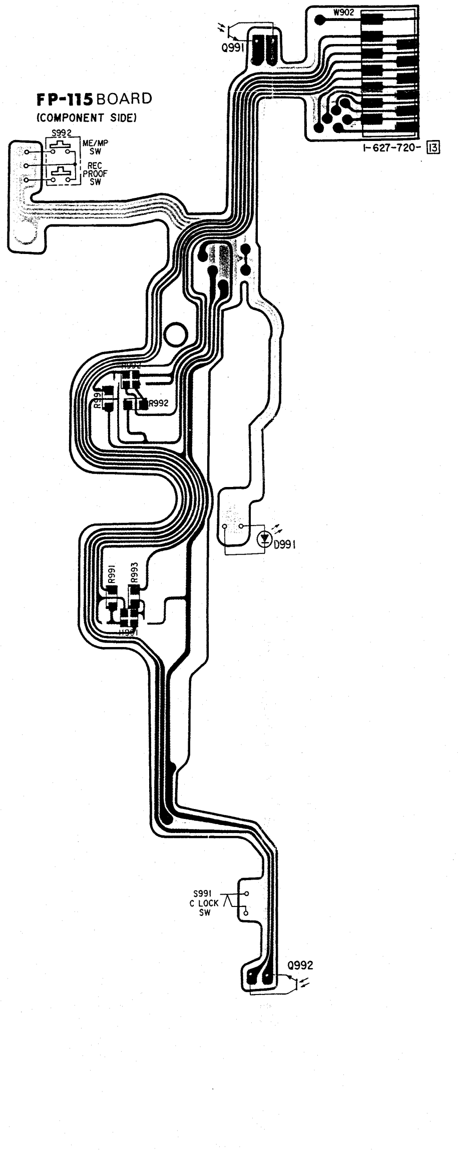
JK-40 BOARD (CONDUCTOR SIDE)


TO VS-22 BOARD CN201
1
2
3
4
5
6
7
8
9
10
J901 1-537-142-12
V
CHASSIS GND
RFU DC OUT
A
JK-40
S921
INPUT
OUTPUT
1-630-589-
12


S909
LOCK → STANDBY
S910
START /STOP
1-466-146- 11

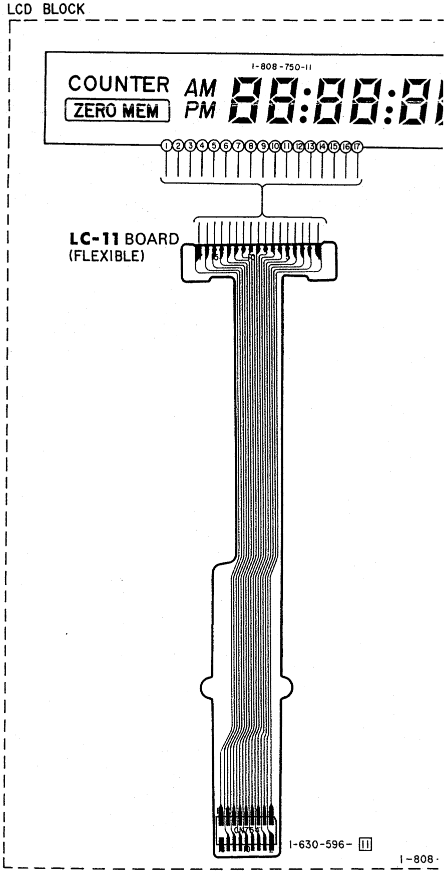

J901 1-537-142-12
V
RFU DC OUT
A

FP-115 BOARD
(COMPONENT SIDE)


S992
ME/MP SW
REC PROOF SW
Q991
W902
1-627-720- 13
R992
D991
R991
R993
H991
S991
C LOCK SW
Q992

LCD BLOCK

LC-11 BOARD
(FLEXIBLE)


1-808-750-11
COUNTER
ZERO MEM
AM
PM
88:88:8
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
CN754
1-630-596- 11
1-808-

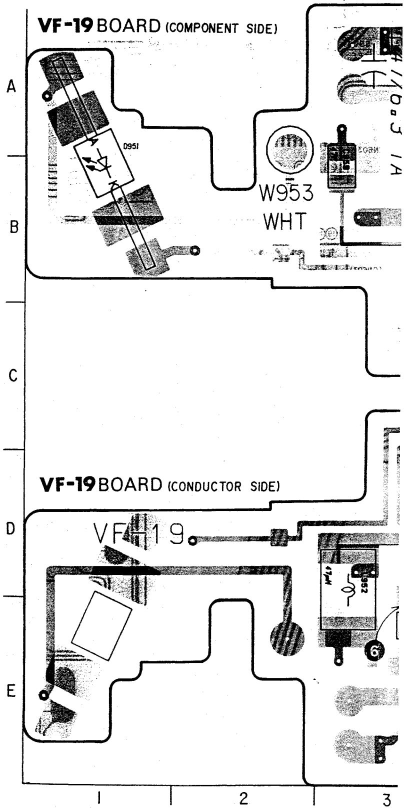
- **For printed wiring boards.**
- Through hole (⊗) is omitted.

Caution:

Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.

VF-19 (ELECTRICAL VIEW FINDER), TL-26 (TALLY LED) PRINTED WIR

— Ref. No. VF-19 BOARD: 8000 series, TL-26 BOARD: 9000 series —


VF-19 BOARD (COMPONENT SIDE)
A
B
C
D
E
D951
W953
WHT
VF-19 BOARD (CONDUCTOR SIDE)
VF-19
6
1
2
3

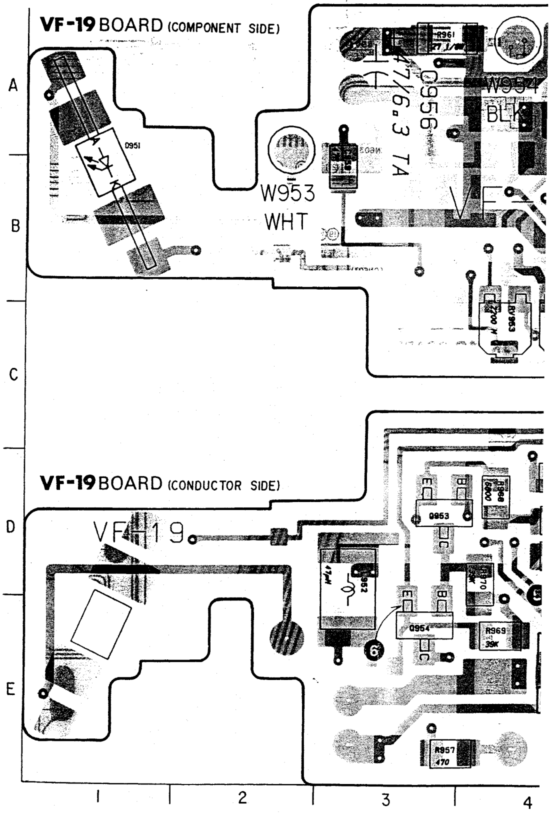
- **For printed wiring boards.**
- Through hole (⊗) is omitted.

Caution:

Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.

VF-19 (ELECTRICAL VIEW FINDER), TL-26 (TALLY LED) PRINTED WIRING BOARDS

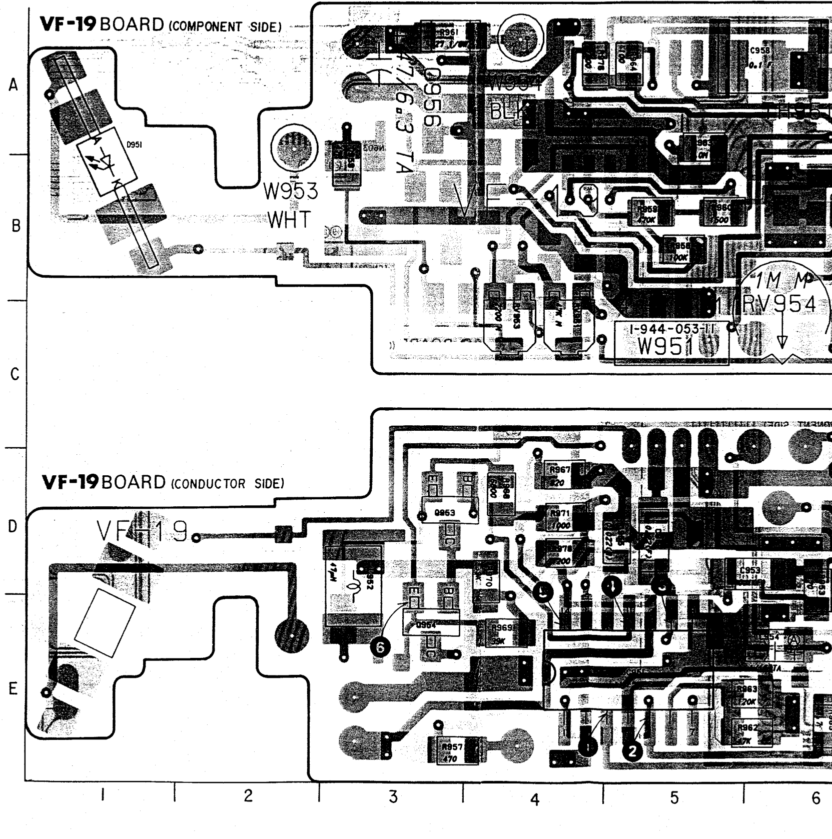
— Ref. No. VF-19 BOARD: 8000 series, TL-26 BOARD: 9000 series —

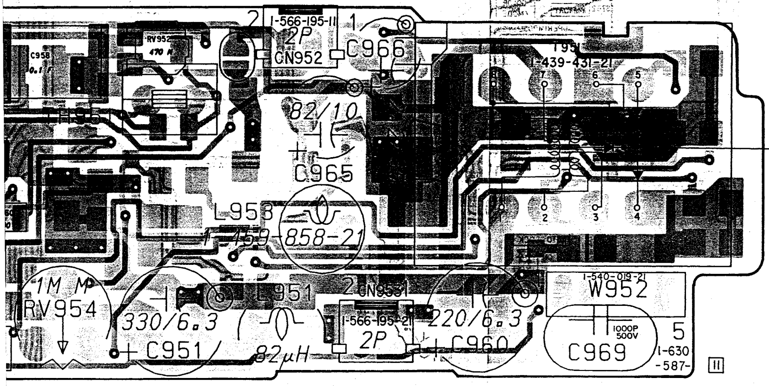

VF-19 BOARD (COMPONENT SIDE)
VF-19 BOARD (CONDUCTOR SIDE)
A
B
C
D
E
1
2
3
4
D951
W953
WHT
W954
BLK
C956
47/6.3 TA
R961
VF-19
Q953
Q954
R968
6800
R969
39K
R957
470
E
B
C
6

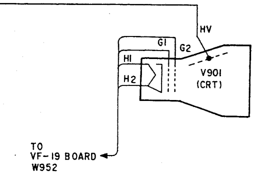
n face side seen from
indicated.
ace side seen from the
cated.

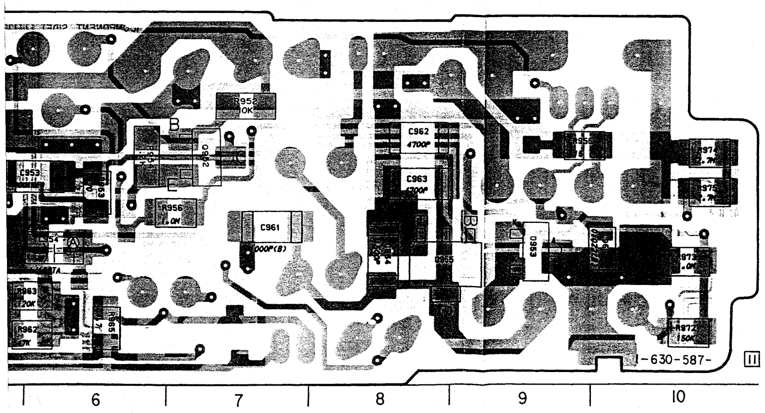
VF-19 (ELECTRICAL VIEW FINDER), TL-26 (TALLY LED) PRINTED WIRING BOARDS

— Ref. No. VF-19 BOARD: 8000 series, TL-26 BOARD: 9000 series —

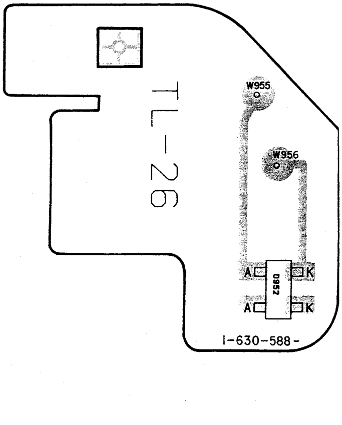

VF-19 BOARD (COMPONENT SIDE)
VF-19 BOARD (CONDUCTOR SIDE)
A
B
C
D
E
1
2
3
4
5
6
D951
W953
WHT
W954
BLK
C956
47/6.3 TA
R961
C958
R959
R960
R958
1M MP
RV954
1-944-053-11
W951
VF-19
Q963
Q964
R967
R971
R969
R957
470
C953
R963
R962
①
②
⑥


RV952
470
C958
0.1
1-566-195-11
2P
CN952
C966
T951
1-439-431-21
82/10
C965
L958
1-459-858-21
1M
RV954
330/6.3
C951
L951
82μH
CN953
1-566-195-21
2P
220/6.3
C960
1-540-019-21
W952
1000P
500V
C969
5
1-630
-587-
11


HV
G1
G2
H1
H2
V901
(CRT)
TO
VF-19 BOARD
W952

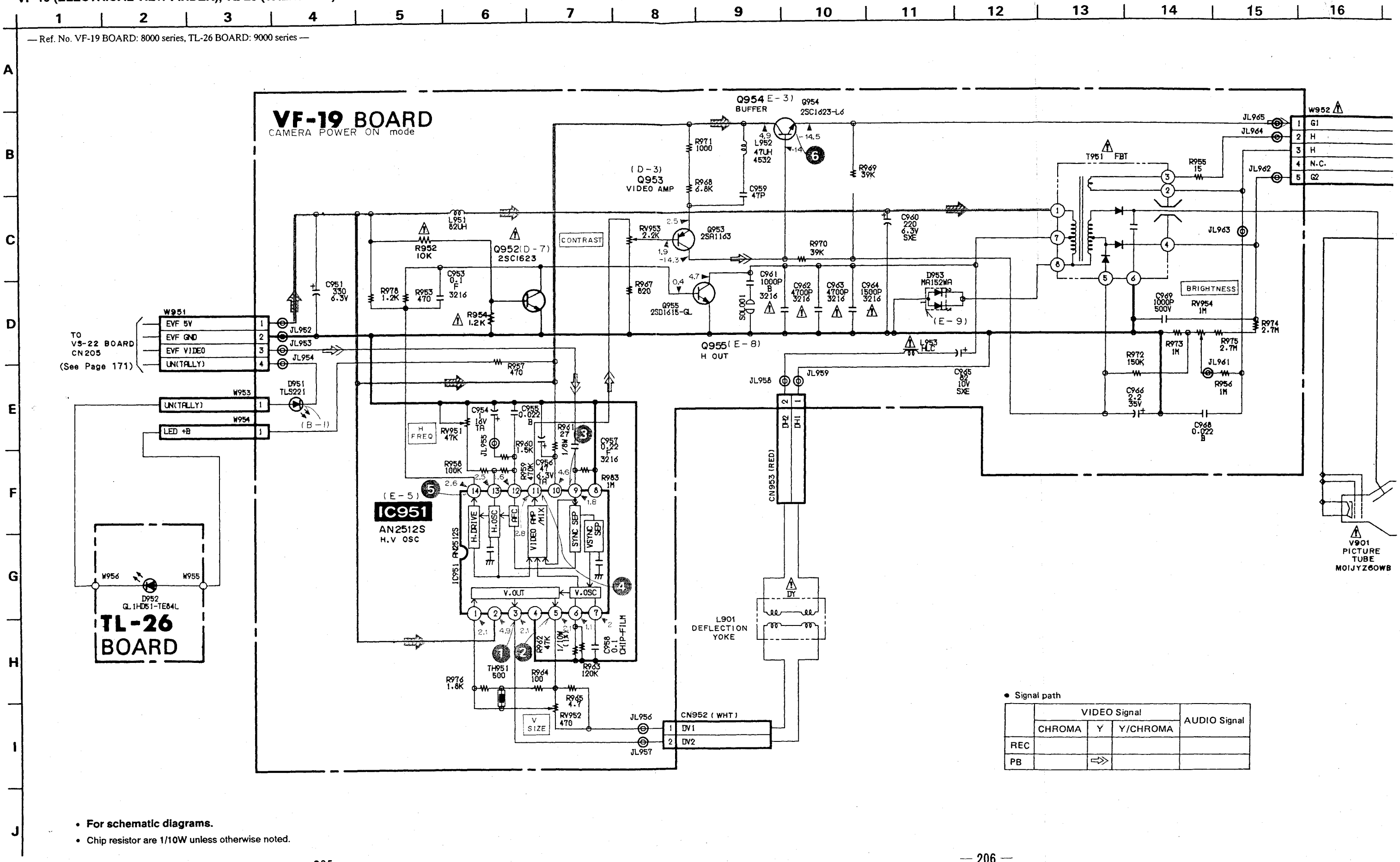

R952
10K
Q952
B
E
C953
R956
1.0M
C961
1000P(B)
C962
4700P
C963
4700P
Q953
R955
R974
R975
R973
R972
150K
R963
120K
R962
47K
1-630-587-
11
6
7
8
9
10

TL-26 BOARD (CONDUCTOR SIDE)


TL-26
W955
W956
D952
A
K
A
K
1-630-588-

VF-19 (ELECTRICAL VIEW FINDER), TL-26 (TALLY LED) SCHEMATIC DIAGRAMS

— Ref. No. VF-19 BOARD: 8000 series, TL-26 BOARD: 9000 series —

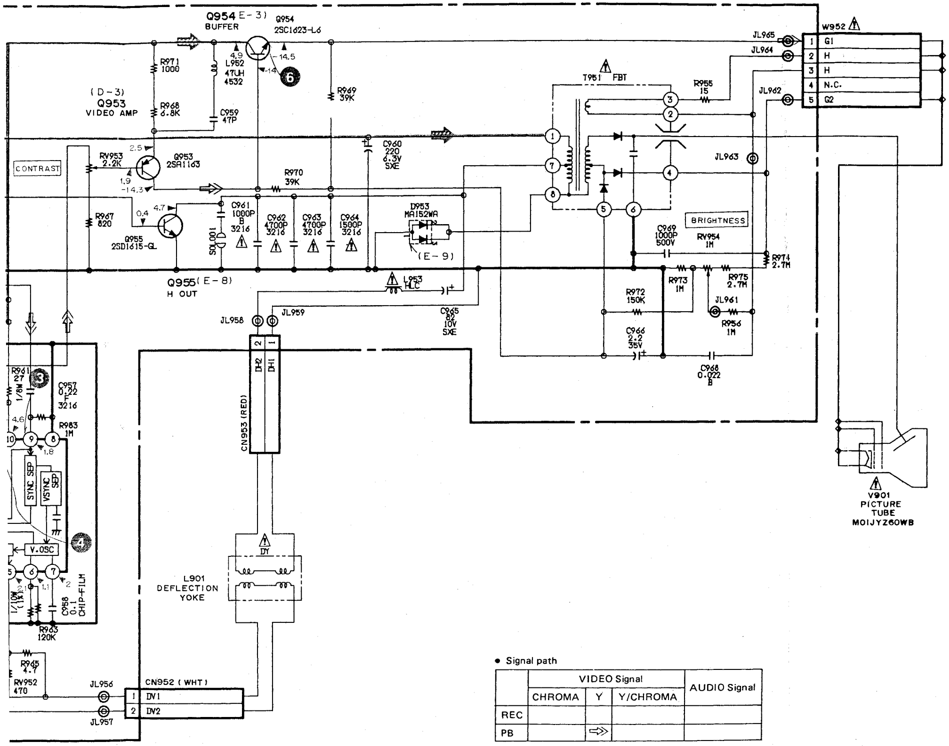


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
A B C D E F G H I J
VF-19 BOARD
CAMERA POWER ON mode
Q954 (E-3) BUFFER
Q954 2SC1623-L6
Q953 (D-3) VIDEO AMP
Q953 2SA1163
Q952 (D-7) 2SC1623
Q955 2SD1615-GL
Q955 (E-8) H OUT
CONTRAST
BRIGHTNESS
H FREQ
V SIZE
T951 FBT
D953 MA152WA
L951 82UH
L952 47UH 4532
L953 HLC
R952 10K
R953 470
R954 1.2K
R955 15
R956 1M
R957 470
R958 100K
R959 470K
R960 1.5K
R961 27 1/8W
R962 47K
R963 120K
R964 100
R965 4.7
R967 820
R968 6.8K
R969 39K
R970 39K
R971 1000
R972 150K
R973 1M
R974 2.7M
R975 2.7M
R976 1.8K
R978 1.2K
R983 1M
RV951 47K
RV952 470
RV953 2.2K
RV954 1M
C951 330 6.3V
C953 0.1 F 3216
C954 10V 1A
C955 0.022 B
C956 47 6.3V 1A
C957 0.22 F 3216
C958 0.1 CHIP-FILM
C959 47P
C960 220 6.3V SXE
C961 1000P B 3216
C962 4700P 3216
C963 4700P 3216
C964 1500P 3216
C965 82 10V SXE
C966 2.2 35V
C968 0.022 B
C969 1000P 500V
TH951 500
IC951 AN2512S H.V OSC
(E-5)
H.DRIVE H.OSC AFC VIDEO AMP /MIX SYNC SEP VSYNC SEP V.OUT V.OSC
W951
EVF 5V
EVF GND
EVF VIDEO
UN(TALLY)
TO VS-22 BOARD CN205 (See Page 171)
W953 UN(TALLY)
W954 LED +B
D951 TLS221 (B-1)
JL952 JL953 JL954 JL955 JL956 JL957 JL958 JL959 JL961 JL962 JL963 JL964 JL965
W952
G1 H H N.C. G2
CN953 (RED) DH2 DH1
CN952 (WHT) DV1 DV2
L901 DEFLECTION YOKE
DY
V901 PICTURE TUBE M01JYZ60WB
TL-26 BOARD
W956 W955
D952 GL1HD51-TE84L

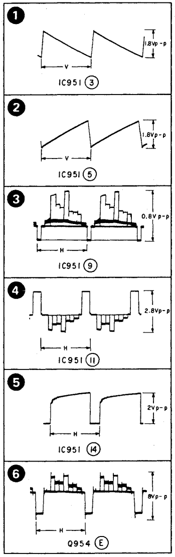
- Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC				
PB		⇨		

- **For schematic diagrams.**
- Chip resistor are 1/10W unless otherwise noted.


Q954 (E-3)
BUFFER
Q954
2SC1623-L6
R971
1000
L952
47UH
4532
4.9
14.5
-14
6
(D-3)
Q953
VIDEO AMP
R968
6.8K
C959
47P
R969
39K
CONTRAST
RV953
2.2K
2.5
Q953
2SA1163
1.9
-14.3
R970
39K
C960
220
6.3V
SXE
R967
820
0.4
4.7
Q955
2SD1615-GL
C961
1000P
B
3216
SOL001
C962
4700P
3216
C963
4700P
3216
C964
1500P
3216
D953
MA152WA
(E-9)
Q955 (E-8)
H OUT
L953
HLC
C965
82
10V
SXE
JL958
JL959
T951 FBT
R955
15
JL965
JL964
JL962
JL963
W952
1 G1
2 H
3 H
4 N.C.
5 G2
BRIGHTNESS
C969
1000P
500V
RV954
1M
R974
2.7M
R973
1M
R975
2.7M
R972
150K
JL961
R956
1M
C966
2.2
35V
C968
0.022
B
R961
27
1/8W
C957
0.22
F
3216
R983
1M
4.6
1.8
SYNC SEP
VSYNC SEP
V.OSC
C958
0.1
CHIP-FILM
R963
120K
R965
4.7
RV952
470
JL956
JL957
CN952 (WHT)
1 DV1
2 DV2
CN953 (RED)
DH2
DH1
L901
DEFLECTION
YOKE
DY
V901
PICTURE
TUBE
M01JYZ60WB

VF-19 BOARD



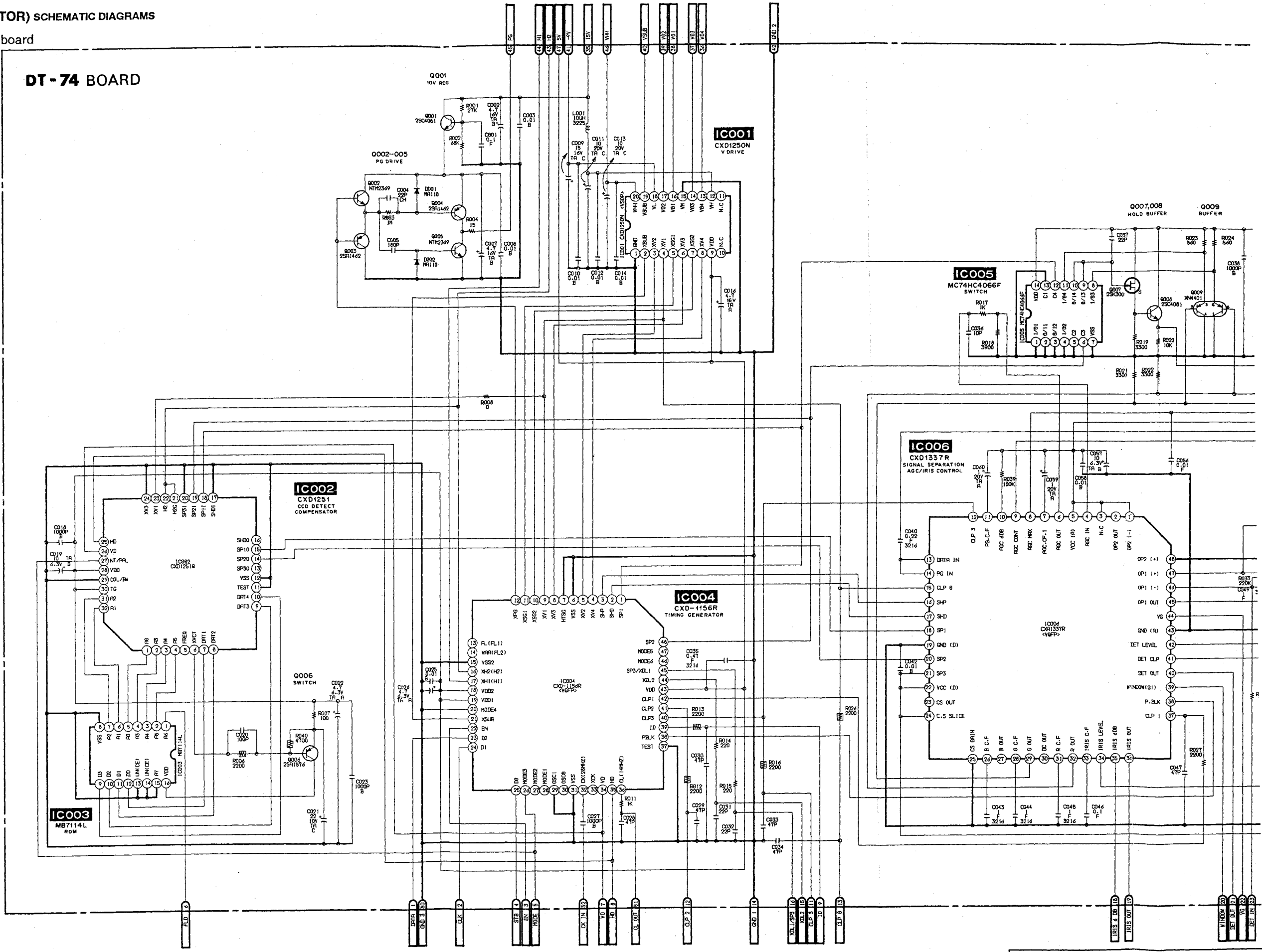
- Signal path

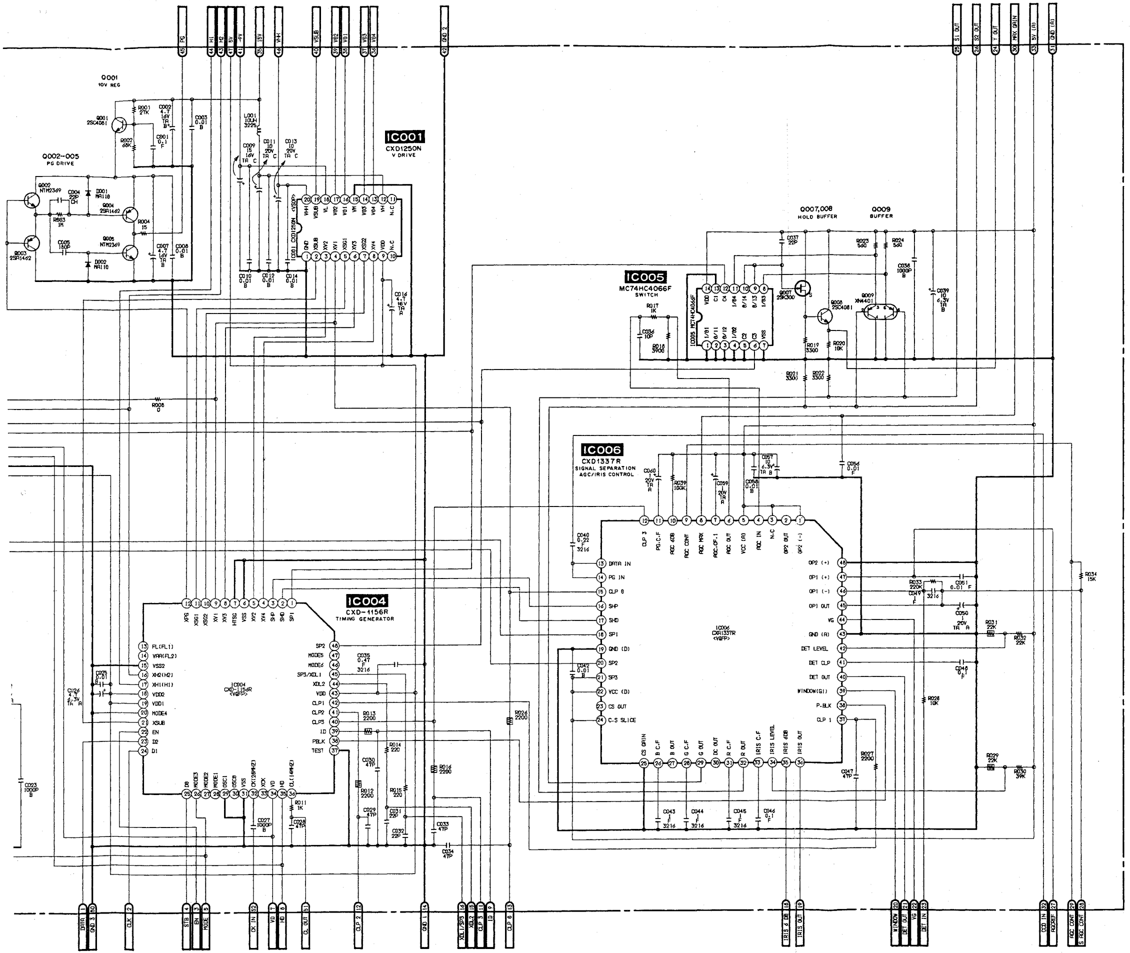
	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC				
PB		⇨		

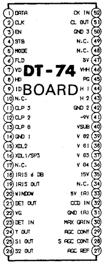
DT-74 (CCD DRIVE, TIMING GENERATOR) SCHEMATIC DIAGRAMS

Reference schematic diagram of DT-74 board

DT-74 board is replaced as a block, so that the PRINTED WIRING BOARD of it is omitted.

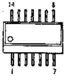

DT-74 BOARD
Q001 10V REG
Q002-005 PG DRIVE
IC001 CXD1250N V DRIVE
IC002 CXD1251 CCD DETECT COMPENSATOR
IC003 MB7114L ROM
IC004 CXD-1156R TIMING GENERATOR
IC005 MC74HC4066F SWITCH
IC006 CXD1337R SIGNAL SEPARATION AGC/IRIS CONTROL
Q006 SWITCH
Q007,008 HOLD BUFFER
Q009 BUFFER
45 PG
44 H1
43 H2
47 5V
41 -7V
35 15V
46 VHH
40 VSUB
39 VD2
38 VD1
37 VD3
36 VD4
42 GND 2
6 FLD
1 DATA
30 GND 3
2 CLK
4 STB
3 EN
5 MODE
32 CK IN
7 VD
8 HD
31 CL OUT
12 CLP 2
14 GND 1
16 XOL1/SP3
15 XOL2
11 CLP 3
9 ID
13 CLP 6
18 IRIS 4 DB
19 IRIS OUT
20 WINDOW
21 DET OUT
22 VG
23 DET IN


Q001
10V REG
Q002-005
PG DRIVE
IC001
CXD1250N
V DRIVE
Q007,008
HOLD BUFFER
Q009
BUFFER
IC005
MC74HC4066F
SWITCH
IC006
CXD1337R
SIGNAL SEPARATION
AGC/IRIS CONTROL
IC004
CXD-1156R
TIMING GENERATOR
PG 45
H1 44
H2 43
5V 47
-9V 41
15V 35
VHH 46
VSUB 40
V02 39
V01 38
V03 37
V04 36
GND 2 42
S1 OUT 25
S2 OUT 26
Y OUT 24
MAX GAIN 30
5V (A) 33
GND (A) 31
DATA 1
GND 3 50
CLK 2
STB 4
EN 3
MODE 5
CK IN 52
VD 7
HD 8
CL OUT 51
CLP 2 12
GND 1 14
XDL1/SP3 16
XDL2 15
CLP 3 11
ID 9
CLP 0 13
IRIS 6 DB 18
IRIS OUT 19
WINDOW 20
DET OUT 21
VG 22
DET IN 23
CCD IN 32
AGCREF 27
AGC CONT 29
S AGC CONT 28


DT-74
BOARD
1 DATA
2 CLK
3 EN
4 STB
5 MODE
6 FLD
7 VD
8 HD
9 ID
10 N.C.
11 CLP 3
12 CLP 2
13 CLP 0
14 GND 1
15 XDL2
16 XDL1/SP3
17 N.C.
18 IRIS 6 DB
19 IRIS OUT
20 WINDOW
21 DET OUT
22 VG
23 DET IN
24 Y OUT
25 S1 OUT
26 S2 OUT
52 CK IN
51 CL OUT
50 GND 3
49 N.C.
48 N.C.
47 5V
46 VHH
45 PG
44 H 1
43 H 2
42 GND 2
41 -9V
40 VSUB
39 V 02
38 V 01
37 V 03
36 V 04
35 15V
34 N.C.
33 5V (A)
32 CCD IN
31 GND (A)
30 MAX GAIN
29 AGC CONT
28 S AGC CONT
27 AGC REF

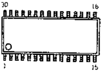
4-3. SEMICONDUCTORS

AN2512S



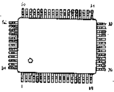
(TOP VIEW)

CXA1047M
CXA1127M



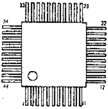
(Top view)

CXA1200BQ
μPD7503GF-J36-3B8

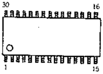


TOP VIEW

CXA1204Q

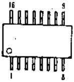

33
23
34
22
44
17

CXA1206N
CXL1501M



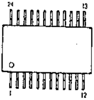
(Top view)

CXD1172M-T1
TK10500M



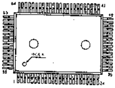
(TOP VIEW)

CXL1503N
CXL1504N



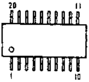
(TOP VIEW)

CXP80116-101Q


64
41
65
40
INDEX
15
24

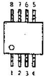
MARKING SIDE VIEW

JSCQ38507SD02R
MB88341PFV



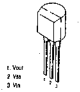
(TOP VIEW)

RC3414M
μPC1037GR-T1

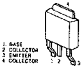


(TOP VIEW)

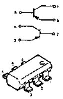
S-81350AG-REG


1. Vout
2 Vss
3 Vin
1 2 3

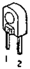
2SB1202FAS


4
1. BASE
2 COLLECTOR
3 EMITTER
4 COLLECTOR
1 2 3

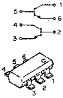
IMT1US
XN4111
XN4113



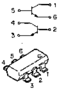
PT4850F



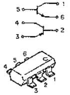
XN4210



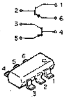
XN4213



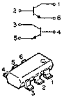
XN4601



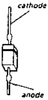
XN6401



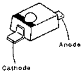
XN6215
XN6501



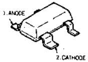
1SS283


cathode
anode

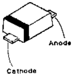
1T32
1T33C-01


Anode
Cathode

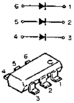
GL1HD51


1. ANODE
2. CATHODE

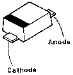
MA110
MA111


Anode
Cathode

MA121



MA8082-M


Anode
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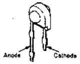
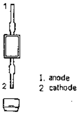
GL453


Anode
Cathode

TLS221


1
2
1. anode
2 cathode

SECTION 5
EXPLODED VIEWS

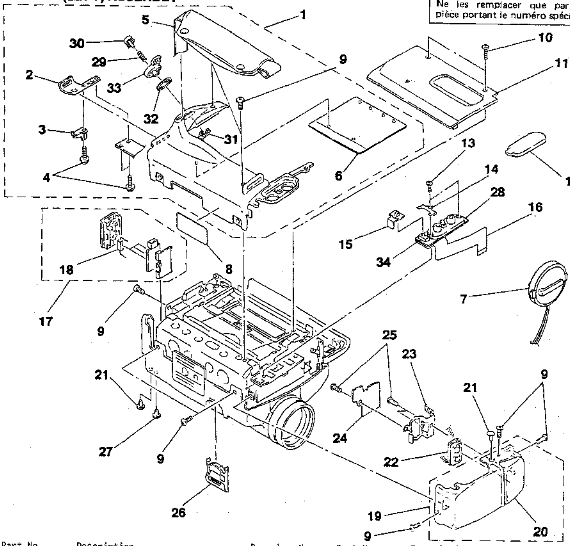
NOTE:

- –XX, –X mean standardized parts, so they may have some differences from the original one.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

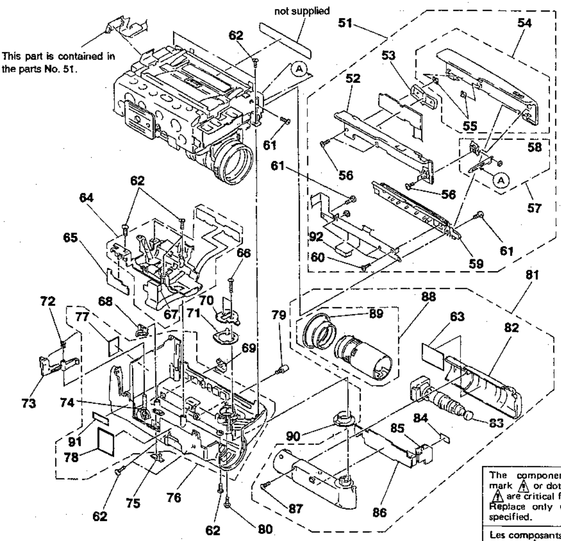
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifé.

5-1. CABINET (LEFT) ASSENBLY



No.	Part No.	Description	Remark
1	A-7080-874-A	CABINET (LEFT) BLOCK ASSY	2-7, 29-33
2	3-736-338-01	BRACKET, BELT	
3	3-736-360-01	JOINT, LR	
4	3-669-480-11	+ PTPWH 2	
5	3-736-807-01	BELT, GRIP	
6	3-736-328-01	COVER, DRUM	
7	A-7091-015-A	CAP ASSY, LENS	
8	*3-736-864-01	LABEL, MODEL NUMBER (U/C)	
9	3-719-381-01	SCREW (M2X4)	
10	3-727-902-11	SCREW (M1.4), SPECIAL	
11	X-3736-337-1	LID ASSY, CASSETTE	
12	3-736-820-01	COVER, JACK	
13	3-719-695-31	SCREW (M1.7X4.5), SPECIAL HEAD	
14	3-736-354-01	PLATE, GROUND, PJ SWITCH	
15	3-736-355-01	KNOB, IN OUT	
16	1-630-589-11	JK-40 FLEXIBLE BOARD	
17	⚠.1-537-217-11	TERMINAL BOARD, BATTERY	18
18	⚠.1-532-778-21	FUSE, MICRO (SECONDARY)	
19	X-3736-336-1	PANEL ASSY, F	20
20	X-3736-314-1	GRILLE ASSY, MICROPHONE	
21	3-728-267-01	COVER, 3.5 JACK (EARPHONE/MIC)	
22	1-542-126-11	MICROPHONE UNIT	
23	3-736-801-01	PLATE, GROUND, MICROPHONE	
24	A-7070-878-A	MA-32 BOARD, COMPLETE	
25	3-719-601-01	SCREW (B2X5), TAPPING	
26	X-3736-303-1	LID ASSY, BATTERY CASE, LITHIUM	
27	3-728-266-01	COVER, 2.5 JACK (REMOTE)	
28	1-537-142-11	TERMINAL BOARD(J901)	
29	3-578-221-00	SPRING, COMPRESSION	
30	3-736-343-01	BUTTON, S/S	
31	3-736-344-01	HOLDER, STAND-BY KNOB	
32	3-736-364-01	SPRING	
33	3-736-391-01	KNOB, STAND-BY	
34	1-570-134-11	SWITCH,SLIDE(S921)	

5-2. CABINET (RIGHT) ASSEMBLY



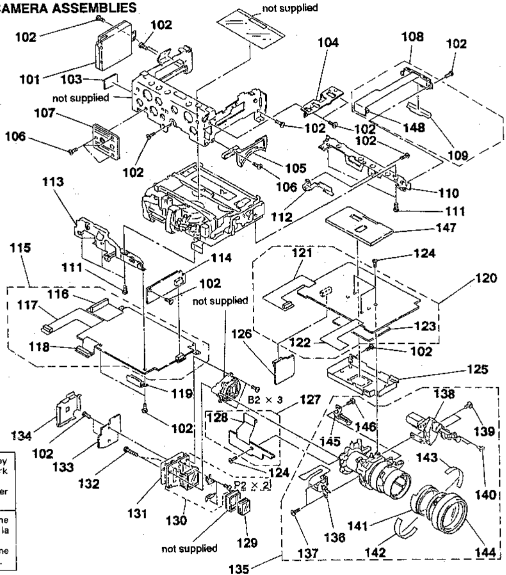
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifé.

No.	Part No.	Description	Remark
51	1-466-146-41	SWITCH BLOCK, FK-9	52-60, 92
52	X-3736-315-1	LID (REAR) ASSY, GRIP	
53	*3-736-376-01	BUTTON, ZOOM	
54	X-3736-338-1	LID (FRONT) ASSY, GRIP	55
55	3-716-418-01	NUT, FRAME PLATE	
56	3-736-362-01	SCREW (M1.7X3), 0 P2	
57	A-7091-018-A	LEVER BLOCK ASSY, LID	58
58	3-701-436-11	WASHER, 1.6 POLYETHYLENE	
59	X-3736-335-1	PANEL ASSY, VTR	
60	3-736-363-01	SCREW (2X6), TAPPING, 0 K1	
61	3-713-786-51	SCREW (M2X3)	
62	3-719-408-01	SCREW (B2), TAPPING, P3	
63	3-727-162-01	LABEL	
64	1-466-147-11	SWITCH BLOCK, CF-4	67
65	A-7070-876-A	EL-1 BOARD, COMPLETE	
66	3-719-381-41	SCREW (M2X10)	
67	1-568-334-11	CONNECTOR, BOARD TO BOARD 16P (CF-4 SWITCH BLOCK CN751)	
68	3-736-389-01	SLIDER, RELEASE	
69	3-736-387-01	BUTTON, BATTERY RELEASE	
70	3-736-334-01	PLATE, LOCK, TILT	
71	3-736-333-01	SPRING, LEAF	
72	3-736-828-01	SPRING	
73	3-736-388-01	LEVER, RELEASE	
74	3-736-386-01	SLIDER, AUTO LOCK	
75	3-736-385-01	BUTTON, AUTO LOCK	
76	X-3736-339-1	CABINET (R) ASSY	77, 78, 91
77	*3-719-683-01	LABEL, BATTERY FITTING	
78	*3-704-256-01	LABEL, CAUTION (US MODEL)	
79	3-736-822-01	SCREW, GUIDE	
80	3-719-381-01	SCREW (M2X4)	
81	A-7019-166-A	EVF COMPLETE ASSY	63, 82-89
82	X-3736-304-1	CABINET (UPPER) ASSY, EVF	
83	⚠1-452-482-31	CRT ASSY (M91JYZ60WB) (V901)	
84	3-704-233-01	LABEL, CAUTION, HIGH VOLTAGE	
85	1-630-588-11	TL-26 BOARD	
86	*A-7061-784-A	VF-19 BOARD, COMPLETE	
87	3-713-790-31	SCREW (M2X8), TAPPING, P3	
88	A-7080-872-A	HOLDER BLOCK ASSY, FINDER	89
89	3-736-370-01	EYE CUP	
90	3-724-514-01	SLEEVE, EVF	
91	*3-704-367-01	LABEL (US MODEL)	
92	1-568-335-11	CONNECTOR, BOARD TO BOARD 18P	

Be sure to read "Precautions for Replacement of CCD Imager" on page 150 when changing the CCD imager.

5-3. MAIN BOARD AND CAMERA ASSEMBLIES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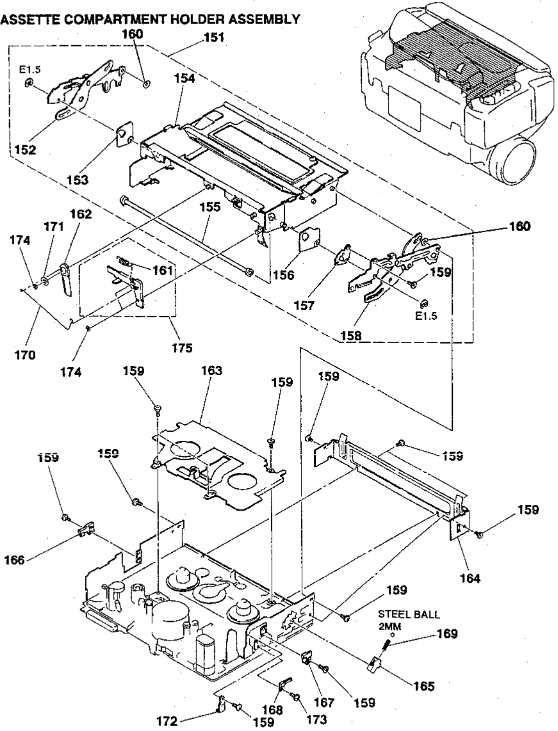
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

No.	Part No.	Description	Remark
101	⚠ 1-466-148-11	CONVERTER UNIT, DC-DC	
102	3-713-786-51	SCREW (M2X3)	
103	*3-704-437-01	LABEL, CAUTION, FUSE REPLACEMENT (US MODEL)	
104	*X-3736-311-1	BRACKET ASSY, PJ	
105	3-736-392-01	PANEL, SUB	
106	3-719-381-01	SCREW (M2X4)	
107	3-736-396-01	SCREW, TRIPOD	
108	⚠ 1-808-753-11	DISPLAY BLOCK, LIQUID CRYSTAL	109, 148
109	*3-736-832-01	COVER, PROTECTION, LCD	
110	3-736-803-01	SHEET METAL (F), MD FITTING	
111	3-704-197-21	SCREW (M1.4X2.5), LOCKING	
112	3-736-365-01	REINFORCEMENT, LCD	
113	3-736-804-01	SHEET METAL (R), MD FITTING	
114	A-7061-661-A	AU-51 BOARD, COMPLETE	
115	A-7061-660-A	VS-22 BOARD, COMPLETE	116-118
116	1-630-590-11	FP-181 FLEXIBLE BOARD	
117	1-630-592-11	FP-184 FLEXIBLE BOARD	
118	1-630-591-11	FP-182 FLEXIBLE BOARD	
119	3-736-323-01	SHIELD, RP CONNECTOR	
120	*A-7061-782-A	VC-60 BOARD, COMPLETE	121-123
121	1-630-594-11	FP-186 FLEXIBLE BOARD	
122	1-630-593-11	FP-185 FLEXIBLE BOARD	
123	A-7068-153-A	DT-74 BOARD, COMPLETE (HIC)	
124	3-719-601-01	SCREW (B2X5), TAPPING	
125	*3-736-319-01	CASE (UPPER), VC SHIELD	
126	A-7061-663-A	TI-15 BOARD, COMPLETE	
127	A-7061-664-A	LD-11 BOARD, COMPLETE	128
128	1-630-595-11	FP-187 FLEXIBLE BOARD	
129	A-7090-879-A	FILTER BLOCK KIT, OPTICAL (OFB-02-02)	
130	A-7030-124-A	IC ICX026BK-2 ASSY (CCD IMAGER)	
131	*3-725-180-01	SHEET, INSULATING, CCD HOLDER	
132	3-335-640-51	SCREW (M2X16)	
133	A-7070-875-A	CD-14 BOARD, COMPLETE	
134	*3-736-321-01	CASE, CCD SHIELD	
135	1-547-335-11	LENS, ZOOM (VCL-1106XA)	136-146
136	3-707-660-01	METER ASSY, EE (IRIS) (M904)	
137	3-707-665-01	SCREW, (B) 3P 1.7X4C	
138	3-707-659-01	MOTOR ASSY, AF/Z GEAR (FOCUS/ZOOM)(M905)	
139	3-707-663-01	SCREW, FITTING	
140	3-707-666-01	SCREW, (B) 3P 1.7X2.8C	
141	3-707-656-01	RING, (F) SCALE	
142	3-707-657-01	TAPE, DISTANCE SCALE FITTING	
143	3-707-658-01	TAPE, DISTANCE SCALE SUPPORT	
144	3-707-661-01	RING UNIT, F	
145	3-707-662-01	SW ASSY, LEAF (FOCUS END SWITCH) (S901)	
146	3-707-664-01	SCREW, (B) 2P 1.7X4.5C	
147	*X-3736-313-1	CASE (LOWER) ASSY, SHIELD, VC	
148	1-568-335-11	CONNECTOR, BOARD TO BOARD 18P (FK-9 SWITCH BLOCK CN603)	

5-4. CASSETTE COMPARTMENT HOLDER ASSEMBLY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STEEL BALL
2MM
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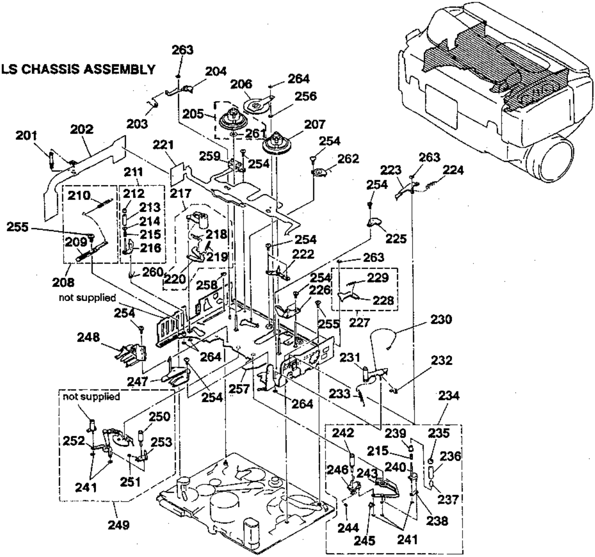
No.	Part No.	Description	Remark
151	*A-7040-156-A	HOLDER BLOCK ASSY	152-159
152	X-3727-937-2	ARM (T) ASSY, F	
153	3-728-145-01	BEARING (T), MIDWAY GEAR	
154	X-3727-950-2	HOLDER ASSY	
155	X-3727-920-1	GEAR ASSY, MIDWAY	
156	3-728-146-01	BEARING (S), MIDWAY GEAR	
157	3-727-992-01	PLATE, ADJUSTMENT, C ARM	
158	X-3727-938-2	ARM (S) ASSY, F	
159	3-728-103-01	SCREW (M1.4X1.6), SPECIAL HEAD	
160	3-727-993-01	SHAFT (A), ARM	
161	3-667-309-00	SPRING, TENSION	
162	X-3727-922-2	PROTECTOR ASSY, T	
163	3-728-227-04	BASE, LED	
164	3-736-808-01	FRAME (2), LS	
165	3-727-973-01	HOLDER, BS	
166	3-727-954-01	HOLDER (T), SENSOR	
167	3-727-957-01	HOLDER (S), SENSOR	
168	1-554-938-11	SWITCH, LEAF (S991)	
169	3-727-935-01	SPRING, COMPRESSION	
170	3-728-277-01	BAR, JOINT	
171	3-728-278-01	WASHER	
172	3-727-946-01	SUPPORT, LS	
173	3-728-148-01	SCREW (M1.4X2.5), SPECIAL HEAD	
174	3-331-007-11	WASHER	
175	A-7040-164-A	ARM BLOCK ASSY, TP	161

5-5. LS CHASSIS ASSEMBLY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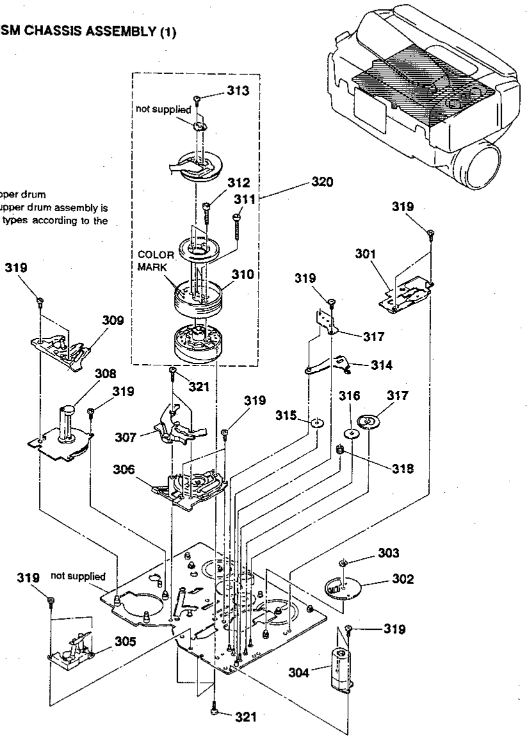
No.	Part No.	Description	Remark
201	3-728-077-01	SHAFT, ROTARY, FLEXIBLE	
202	1-627-722-11	FP-149 FLEXIBLE BOARD	
203	3-728-066-01	SPRING	
204	X-3727-927-1	RATCHET ASSY, T	
205	X-3727-951-2	TABLE ASSY, REEL, TAKE-UP	261
206	X-3727-926-3	ARM ASSY, GEAR	
207	X-3727-952-1	TABLE ASSY, REEL, SUPPLY	
208	A-7040-150-A	SLIDER BLOCK ASSY, CAM	209, 210
209	3-728-089-01	SLIDER, CAM	
210	3-727-936-01	SPRING, TENSION	
211	A-7040-151-A	ARM BLOCK ASSY, TG11	212-216
212	3-728-131-01	FLANGE, UPPER, TG11	
213	3-728-133-01	SLEEVE, TG11	
214	3-728-069-01	FLANGE, LOWER, TG11	
215	3-728-023-01	SPRING, COMPRESSION	
216	X-3727-913-1	ARM ASSY, TG11	
217	A-7040-146-D	ARM BLOCK ASSY, PINCH	218-220
218	3-727-927-01	SPRING (POWER TENSION), TENSION	
219	3-727-928-01	SPRING, TENSION	
220	X-3727-929-2	ARM ASSY, LIMITER	
221	*A-7061-238-A	FP-115 BOARD, COMPLETE	
222	X-3727-928-3	BASE ASSY, RL	
223	3-728-201-01	RATCHET, S	
224	3-728-121-01	SPRING, TENSION	
225	3-728-200-01	ADJUSTMENT BLOCK, TG1	
226	3-728-206-01	PLATE, CAM, LS	
227	A-7040-158-C	ARM BLOCK ASSY, S SOFT	228, 229
228	3-728-205-01	ARM, S SOFT	
229	3-728-072-01	SPRING, TENSION	
230	X-3727-923-2	STRING ASSY	
231	X-3727-946-3	ARM ASSY, TG1	
232	3-728-124-01	HOLDER, JOINT	
233	3-728-071-01	SPRING, TENSION	
234	A-7040-149-A	ARM (S) BLOCK ASSY, GUIDE	215, 235-246
235	3-728-037-01	FLANGE, UPPER, TG4	
236	3-728-049-01	ROLLER, TG4	
237	3-728-048-01	SLEEVE, TG4	
238	3-728-053-01	PLATE, UNDER, TG4	
239	3-728-047-01	FLANGE, LOWER, TG4	
240	X-3727-936-2	BASE ASSY, TG4	
241	3-331-007-11	WASHER	
242	X-3727-935-2	ROLLER ASSY, TG5	
243	X-3727-941-1	ARM (S) ASSY, GUIDE	
244	3-728-289-01	SCREW (M1.2)	
245	3-728-062-01	SPRING (6GB), LEAF	
246	X-3727-948-1	BASE ASSY, TG6	
247	3-728-226-01	RAIL (S), GUIDE	
248	3-728-244-01	RAIL (T), GUIDE	
249	A-7040-148-A	ARM (T) BLOCK ASSY, GUIDE	241, 250-253
250	X-3727-932-2	ROLLER ASSY, TG8	
251	3-728-290-01	SCREW (M1.2)	
252	X-3727-940-1	ARM (T) ASSY, GUIDE	
253	X-3727-947-1	BASE ASSY, TG7	
254	3-728-103-01	SCREW (M1.4X1.6), SPECIAL HEAD	
255	3-728-126-01	SCREW (M1.4X2), SPECIAL HEAD	
256	3-321-394-01	WASHER	
257	X-3727-953-2	CHASSIS ASSY, LS	
258	3-578-254-00	RING, RETAINING, E1.2	
259	1-571-647-11	SWITCH, PUSH (2 KEY) (S992)	
260	3-727-939-01	SPRING, TORSION	
261	3-701-439-11	WASHER	
262	X-3727-914-1	CLUTCH ASSY, ONEWAY	
263	3-728-091-01	WASHER, STOPPER	
264	3-315-414-31	WASHER	

5-6. MECHANISM CHASSIS ASSEMBLY (1)

Note: For rotating upper drum
The rrotating upper drum assembly is divided into 2 types according to the color mark.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COLOR MARK
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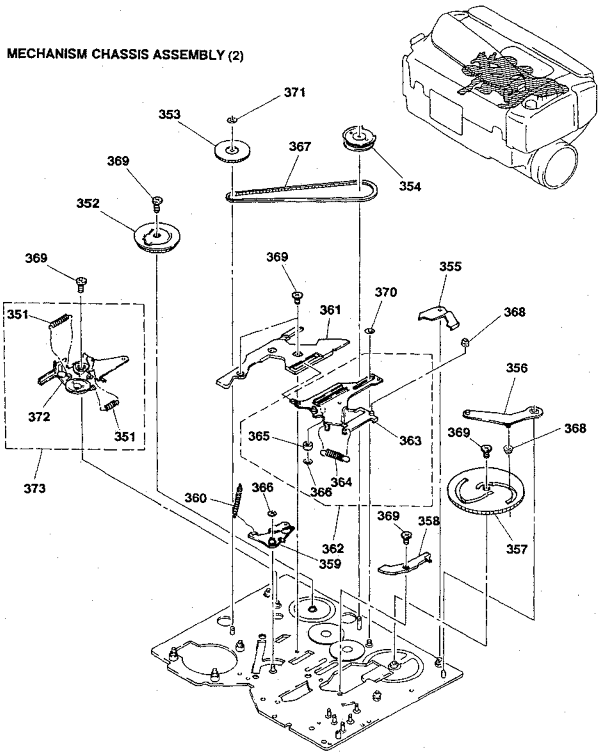
No.	Part No.	Description	Remark
301	3-728-231-01	BASE, TG-1 CAM	
302	X-3727-915-1	GEAR ASSY, MODE	
303	3-325-290-21	WASHER, STOPPER	
304	1-541-607-11	MOTOR, DC (LA12G-344VA) (LOADING) (M903)	
305	A-7040-172-H	BASE (1) BLOCK ASSY, RAIL	
306	X-3727-949-1	BASE ASSY, DRUM	
307	A-7040-171-C	BASE (2) BLOCK ASSY, GUIDE RAIL	
308	8-835-329-01	MOTOR, DC U-21A (CAPSTAN) (M902)	
309	X-3727-933-3	BASE (3) ASSY, GUIDE RAIL	
310	A-7049-189-A	DRUM ASSY, UPPER, ROTARY (DGR-32-R-(2)) MARKING; RED, BLUE, REDDISH-BROWN OR BLUISH-BROWN	
310	A-7049-190-A	DRUM ASSY, UPPER, ROTARY (DGR-32-R-(1)) MARKING; GREEN, BLACK, GREENISH-BROWN OR BLACKISH-BROWN	
311	3-727-809-01	SCREW (M1.4X5), HEXAGONAL HOLE	
312	3-727-807-01	SCREW (M1.7X3.3), HEXAGONAL HOLE	
313	3-728-108-21	SCREW (M1.4X2.7)	
314	X-3727-906-1	ARM ASSY	
315	X-3727-903-1	GEAR ASSY, NO.1	
316	X-3727-904-1	GEAR ASSY, NO.2	
317	3-728-119-01	RETAINER, GEAR	
318	3-728-149-01	GEAR, NO.0	
319	3-728-148-01	SCREW (M1.4X2.5), SPECIAL HEAD	
320	A-7048-202-A	DRUM BLOCK ASSY (DGH-32A)(M901) 310-313	
321	3-728-108-01	SCREW (M1.4X4.5)	

5-7. MECHANISM CHASSIS ASSEMBLY (2)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No.	Part No.	Description	Remark
351	3-728-065-01	SPRING, TENSION	
352	3-728-190-01	CAM (B)	
353	X-3727-930-1	GEAR ASSY, CONVERSION	
354	X-3727-931-1	PULLEY ASSY, MIDWAY	
355	3-728-154-01	ARM, EJ	
356	X-3727-916-1	ARM ASSY, LS	
357	3-728-208-01	CAM (A)	
358	3-728-213-01	SUPPORT (S), GL	
359	X-3727-924-2	ARM ASSY, GUIDE LOCK	
360	3-728-015-01	SPRING (POWER TENSION), TENSION	
361	3-728-228-03	SUPPORT (T), GL	
362	A-7040-153-A	SLIDER BLOCK ASSY, GL	363-366
363	X-3727-942-1	SLIDER ASSY, GL	
364	3-727-929-01	SPRING (POWER TENSION), TENSION	
365	3-728-144-01	ROLLER, GL	
366	3-331-007-11	WASHER	
367	3-728-212-01	BELT, RELAY	
368	3-728-109-01	ROLLER, LS	
369	3-728-148-01	SCREW (M1.4X2.5), SPECIAL HEAD	
370	3-315-384-31	WASHER, STOPPER	
371	3-728-091-01	WASHER, STOPPER	
372	X-3727-944-1	ARM ASSY, PINCH PRESS	
373	A-7040-152-A	ARM BLOCK ASSY, PINCH PRESS	351, 372

SECTION 6
ELECTRICAL PARTS LIST

FP-115 **VS-22**

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
  All resistors are in ohms
  METAL : Metal-film resistor
  METAL OXIDE : Metal Oxide-film resistor
  F : nonflammable
- –XX, –X mean standardized parts, so they may have some difference from the original one.
- SEMICONDUCTORS
  In each case, U : μ, for example:
  UA...: μA..., UPA...: μPA..., UPB...: μPB..., UPC...: μPC..., UPD...: μPD...
- CAPACITORS
  MF : μF, PF : μμF
- COILS
  MMH : mH, UH : μH

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description		Remark
	*A-7061-238-A	FP-115 BOARD, COMPLETE (Ref.No 6,000 Series) ***********************		
	3-727-954-01	HOLDER (T), SENSOR		
	3-727-957-01	HOLDER (S), SENSOR		
		DIODE		
D991	8-719-951-03	DIODE GL453		
		TRANSISTOR		
Q991	8-729-907-25	TRANSISTOR PT4850F		
Q992	8-729-907-25	TRANSISTOR PT4850F		
		RESISTOR		
R991	1-216-817-11	METAL GLAZE 470	5%	1/16W
R992	1-216-817-11	METAL GLAZE 470	5%	1/16W
R993	1-216-817-11	METAL GLAZE 470	5%	1/16W
R994	1-216-817-11	METAL GLAZE 470	5%	1/16W
		SWITCH		
S991	1-554-938-11	SWITCH, LEAF (CASSETTE LOCK)		
S992	1-571-647-11	SWITCH, PUSH (2 KEY) (REC PROOF, ME/MP)		
***				
	A-7061-660-A	VS-22 BOARD, COMPLETE (Ref.No 5,000 Series) **********************		
	1-630-590-11	FP-181 FLEXIBLE BOARD		
	1-630-591-11	FP-182 FLEXIBLE BOARD		
	*3-736-316-01	CASE (UPPER), RP SHIELD		
	*3-736-317-01	CASE (LOWER), RP SHIELD		
	*3-736-318-01	PLATE, SHIELD, VC DELAY LINE		
	*3-736-322-01	CASE, FE SHIELD		
	*3-736-324-01	PLATE (LEFT), VS GROUND		
	*3-736-325-01	PLATE (RIGHT), VS GROUND		
		CAPACITOR		
C101	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C102	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C104	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C105	1-162-945-11	CERAMIC CHIP 22PF	5%	50V
C106	1-162-945-11	CERAMIC CHIP 22PF	5%	50V
C107	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C108	1-135-161-21	TANTAL. CHIP 22MF	20%	10V
C109	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C110	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C111	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C112	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C113	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C114	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C115	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C116	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C117	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C118	1-162-968-11	CERAMIC CHIP 0.0047MF	10%	50V
C119	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C120	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C121	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C123	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C124	1-162-968-11	CERAMIC CHIP 0.0047MF	10%	50V
C125	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C126	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C127	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C128	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C129	1-162-945-11	CERAMIC CHIP 22PF	5%	50V
C130	1-162-945-11	CERAMIC CHIP 22PF	5%	50V
C131	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C132	1-135-161-21	TANTAL. CHIP 22MF	20%	10V
C133	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C134	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C135	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C136	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C137	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C138	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C139	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C140	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C141	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C142	1-162-968-11	CERAMIC CHIP 0.0047MF	10%	50V
C143	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C144	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C145	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C146	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C147	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C148	1-162-968-11	CERAMIC CHIP 0.0047MF	10%	50V
C149	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C150	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C151	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C152	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C161	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C162	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C163	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C164	1-135-161-21	TANTAL. CHIP 22MF	20%	10V
C165	1-162-948-11	CERAMIC CHIP 39PF	5%	50V
C166	1-162-963-11	CERAMIC CHIP 680PF	10%	50V
C167	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C168	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C169	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C170	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C171	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C172	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C173	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C174	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C175	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C176	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C177	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C178	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C179	1-135-147-21	TANTAL. CHIP 1MF	20%	20V

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Ref.No	Part No.	Description		Remark
C180	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C181	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C182	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C183	1-135-161-21	TANTAL. CHIP 22MF	20%	10V
C184	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C185	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C186	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C191	1-162-968-11	CERAMIC CHIP 0.0047MF	10%	50V
C192	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C193	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C194	1-162-927-11	CERAMIC CHIP 100PF	5%	50V
C195	1-162-927-11	CERAMIC CHIP 100PF	5%	50V
C196	1-164-217-11	CERAMIC CHIP 150PF	0.25PF	50V
C201	1-135-145-11	TANTAL. CHIP 0.47MF	20%	35V
C202	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C203	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C204	1-126-205-11	ELECT CHIP 47MF	20%	6.3V
C205	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C206	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C207	1-126-246-11	ELECT CHIP 220MF	20%	4V
C208	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C209	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C210	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C211	1-135-149-21	TANTAL. CHIP 2.2MF	20%	10V
C212	1-135-146-21	TANTAL. CHIP 0.68MF	20%	25V
C213	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C214	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C215	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C216	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C217	1-135-145-11	TANTAL. CHIP 0.47MF	20%	35V
C218	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C219	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C220	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C221	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C222	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C223	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C224	1-135-149-21	TANTAL. CHIP 2.2MF	20%	10V
C225	1-135-149-21	TANTAL. CHIP 2.2MF	20%	10V
C226	1-135-149-21	TANTAL. CHIP 2.2MF	20%	10V
C227	1-135-149-21	TANTAL. CHIP 2.2MF	20%	10V
C228	1-163-133-00	CERAMIC CHIP 470PF	5%	50V
C229	1-162-638-11	CERAMIC CHIP 1MF		16V
C230	1-162-638-11	CERAMIC CHIP 1MF		16V
C231	1-135-149-21	TANTAL. CHIP 2.2MF	20%	10V
C232	1-135-149-21	TANTAL. CHIP 2.2MF	20%	10V
C233	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C234	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C235	1-162-638-11	CERAMIC CHIP 1MF		16V
C236	1-162-638-11	CERAMIC CHIP 1MF		16V
C237	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C238	1-162-638-11	CERAMIC CHIP 1MF		16V
C239	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C240	1-162-944-11	CERAMIC CHIP 18PF	5%	50V

Ref.No	Part No.	Description		Remark
C241	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C242	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C243	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C244	1-162-638-11	CERAMIC CHIP 1MF		16V
C245	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C246	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C247	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C248	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C249	1-135-149-21	TANTAL. CHIP 2.2MF	20%	10V
C250	1-162-958-11	CERAMIC CHIP 270PF	5%	50V
C251	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C253	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C254	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C255	1-164-227-11	CERAMIC CHIP 0.022MF	10%	25V
C256	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C257	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C258	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C259	1-162-926-11	CERAMIC CHIP 82PF	5%	50V
C261	1-163-137-00	CERAMIC CHIP 680PF	5%	50V
C262	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C263	1-163-141-00	CERAMIC CHIP 0.001MF	5%	50V
C264	1-162-955-11	CERAMIC CHIP 150PF	5%	50V
C265	1-162-946-11	CERAMIC CHIP 27PF	5%	50V
C266	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C267	1-163-133-00	CERAMIC CHIP 470PF	5%	50V
C268	1-163-131-00	CERAMIC CHIP 390PF	5%	50V
C269	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C270	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C271	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C272	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C273	1-162-941-11	CERAMIC CHIP 10PF	0.5PF	50V
C274	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C275	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C276	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C277	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C278	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C279	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C280	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C281	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C282	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C283	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C284	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C285	1-135-161-21	TANTAL. CHIP 22MF	20%	10V
C286	1-135-161-21	TANTAL. CHIP 22MF	20%	10V
C287	1-162-951-11	CERAMIC CHIP 68PF	5%	50V
C288	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C289	1-135-161-21	TANTAL. CHIP 22MF	20%	10V
C290	1-162-959-11	CERAMIC CHIP 330PF	5%	50V
C291	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C293	1-135-161-21	TANTAL. CHIP 22MF	20%	10V
C294	1-135-145-11	TANTAL. CHIP 0.47MF	20%	35V
C295	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C296	1-162-946-11	CERAMIC CHIP 27PF	5%	50V

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description		Remark
C297	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C298	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C299	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C300	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C301	1-162-945-11	CERAMIC CHIP 22PF	5%	50V
C302	1-135-162-21	TANTAL. CHIP 33MF	20%	6.3V
C303	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C304	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C305	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C306	1-163-986-00	CERAMIC CHIP 0.027MF	10%	25V
C307	1-162-951-11	CERAMIC CHIP 68PF	5%	50V
C308	1-162-966-11	CERAMIC CHIP 0.0022MF	10%	50V
C309	1-162-947-11	CERAMIC CHIP 33PF	5%	50V
C310	1-162-955-11	CERAMIC CHIP 150PF	5%	50V
C312	1-162-949-11	CERAMIC CHIP 47PF	5%	50V
C313	1-162-962-11	CERAMIC CHIP 470PF	10%	50V
C314	1-135-161-21	TANTAL. CHIP 22MF	20%	10V
C315	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C316	1-162-948-11	CERAMIC CHIP 39PF	5%	50V
C317	1-162-943-11	CERAMIC CHIP 15PF	5%	50V
C318	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C319	1-162-949-11	CERAMIC CHIP 47PF	5%	50V
C320	1-162-956-11	CERAMIC CHIP 180PF	5%	50V
C321	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C322	1-162-949-11	CERAMIC CHIP 47PF	5%	50V
C323	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C324	1-162-952-11	CERAMIC CHIP 82PF	5%	50V
C325	1-162-967-11	CERAMIC CHIP 0.0033MF	10%	50V
C326	1-126-205-11	ELECT CHIP 47MF	20%	6.3V
C327	1-162-943-11	CERAMIC CHIP 15PF	5%	50V
C328	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C331	1-162-958-11	CERAMIC CHIP 270PF	5%	50V
C334	1-164-227-11	CERAMIC CHIP 0.022MF	10%	25V
C335	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C336	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C337	1-162-942-11	CERAMIC CHIP 12PF	5%	50V
C338	1-164-227-11	CERAMIC CHIP 0.022MF	10%	25V
C339	1-162-945-11	CERAMIC CHIP 22PF	5%	50V
C340	1-162-945-11	CERAMIC CHIP 22PF	5%	50V
C356	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C357	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C366	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C501	1-136-718-11	TANTAL. CHIP 0.1MF	5%	25V
C502	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C503	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C504	1-135-070-00	TANTAL. CHIP 0.1MF	20%	35V
C505	1-163-037-11	CERAMIC CHIP 0.022MF	10%	25V
C506	1-127-561-11	ELECT(SOLID) 33MF	20%	10V
C507	1-127-561-11	ELECT(SOLID) 33MF	20%	10V
C508	1-127-561-11	ELECT(SOLID) 33MF	20%	10V
C509	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C510	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C511	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C512	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C513	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C514	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C515	1-135-149-21	TANTAL. CHIP 2.2MF	20%	10V
C516	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C518	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C519	1-162-969-11	CERAMIC CHIP 0.0068MF	10%	25V
C520	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C521	1-162-638-11	CERAMIC CHIP 1MF		16V
C522	1-135-159-21	TANTAL. CHIP 10MF	20%	20V
C523	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C524	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C525	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C526	1-163-075-00	CERAMIC CHIP 0.047MF	10%	25V
C542	1-162-968-11	CERAMIC CHIP 0.0047MF	10%	50V
C543	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C544	1-162-967-11	CERAMIC CHIP 0.0033MF	10%	50V
C546	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C547	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C548	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C549	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C550	1-162-638-11	CERAMIC CHIP 1MF		16V
C551	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C552	1-164-227-11	CERAMIC CHIP 0.022MF	10%	25V
C553	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C554	1-164-227-11	CERAMIC CHIP 0.022MF	10%	25V
C555	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C556	1-162-638-11	CERAMIC CHIP 1MF		16V
C557	1-162-638-11	CERAMIC CHIP 1MF		16V
C558	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C559	1-162-921-11	CERAMIC CHIP 33PF	5%	50V
C560	1-162-921-11	CERAMIC CHIP 33PF	5%	50V
C561	1-162-638-11	CERAMIC CHIP 1MF		16V
C562	1-163-133-00	CERAMIC CHIP 470PF	5%	50V
C563	1-163-141-00	CERAMIC CHIP 0.001MF	5%	50V
C564	1-162-949-11	CERAMIC CHIP 47PF	5%	50V
C565	1-163-145-00	CERAMIC CHIP 0.0015MF	5%	50V
C566	1-162-945-11	CERAMIC CHIP 22PF	5%	50V
C567	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C571	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C572	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C573	1-162-915-11	CERAMIC CHIP 10PF	0.5PF	50V
C601	1-162-916-11	CERAMIC CHIP 12PF	5%	50V
C602	1-162-916-11	CERAMIC CHIP 12PF	5%	50V
C603	1-162-968-11	CERAMIC CHIP 0.0047MF	10%	50V
C604	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C606	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C607	1-124-443-00	ELECT 100MF	20%	10V
C608	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C609	1-162-638-11	CERAMIC CHIP 1MF		16V
C610	1-162-638-11	CERAMIC CHIP 1MF		16V
C611	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C612	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description		Remark
C613	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C614	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C615	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C616	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C618	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C622	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C623	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C661	1-162-972-11	CERAMIC CHIP 0.0022MF		50V
C662	1-163-023-00	CERAMIC CHIP 0.015MF		50V
C663	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C664	1-163-133-00	CERAMIC CHIP 470PF	5%	50V
C665	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C666	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C667	1-163-081-00	CERAMIC CHIP 0.22MF		25V
C668	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C669	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C681	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C682	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C690	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C691	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V

CONNECTOR

Ref.No	Part No.	Description	Remark
CN101	1-566-531-11	CONNECTOR, FPC (ZIF) 15P	
CN201	1-566-542-31	CONNECTOR, FPC (NON ZIF) 10P	
CN202	1-568-342-41	CONNECTOR, BOARD TO BOARD 7P	
CN203	1-568-333-11	CONNECTOR, BOARD TO BOARD 14P	
CN204	1-568-364-41	CONNECTOR, BOARD TO BOARD 12P	
CN205	*1-565-876-11	PIN, CONNECTOR (PC BOARD) 4P	
CN501	1-566-541-11	CONNECTOR, FPC (NON ZIF) 9P	
CN502	1-565-662-11	CONNECTOR (PC BOARD) 15P	
CN601	1-566-538-11	CONNECTOR, FPC (NON ZIF) 6P	
CN602	1-566-546-11	CONNECTOR, FPC (NON ZIF) 14P	
CN603	1-568-367-41	CONNECTOR, BOARD TO BOARD 18P	
CN604	1-568-334-11	CONNECTOR, BOARD TO BOARD 16P	
CN605	1-568-329-11	CONNECTOR, BOARD TO BOARD 17P	
CN607	1-565-527-11	PIN, CONNECTOR (PC BOARD) 2P	

DIODE

Ref.No	Part No.	Description	Remark
D201	8-719-420-15	DIODE MA8082-M	
D202	8-719-420-15	DIODE MA8082-M	
D205	8-719-420-15	DIODE MA8082-M	
D206	8-719-420-15	DIODE MA8082-M	
D207	8-719-420-15	DIODE MA8082-M	
D210	8-719-404-35	DIODE MA141WK	
D211	8-719-118-21	DIODE 1SS283	
D212	8-719-404-46	DIODE MA110	
D215	8-719-800-76	DIODE 1SS226	
D215	8-719-914-49	DIODE DA204K	
D216	8-719-404-35	DIODE MA141WK	
D217	8-719-404-46	DIODE MA110	
D218	8-719-404-46	DIODE MA110	
D501	8-719-938-75	DIODE SB05-05CP	
D502	8-719-938-75	DIODE SB05-05CP	
D503	8-719-938-75	DIODE SB05-05CP	
D601	8-719-404-40	DIODE MA121	
D602	8-719-404-40	DIODE MA121	
D603	8-719-404-40	DIODE MA121	
D604	8-719-404-40	DIODE MA121	
D605	8-719-404-46	DIODE MA110	
D606	8-719-404-46	DIODE MA110	

FILTER

Ref.No	Part No.	Description	Remark
FL201	1-236-146-11	FILTER, BAND PASS	
FL202	1-409-439-11	FILTER, TRAP	
FL203	1-567-306-11	FILTER, CERAMIC	

IC

Ref.No	Part No.	Description	Remark
IC101	8-752-033-38	IC CXA12D2R	
IC102	8-752-033-38	IC CXA1202R	
IC201	8-752-033-40	IC CXA1201Q	
IC202	8-752-323-46	IC CXL1501M	
IC203	8-752-034-40	IC CXA1200BQ	
IC205	8-759-009-22	IC MC14094BF	
IC501	8-752-036-52	IC CXA1206N	
IC502	8-759-030-39	IC JSCQ38507SD02R	
IC503	8-759-107-68	IC CX20115A	
IC504	8-759-805-06	IC CXA1127M	
IC505	8-759-209-53	IC CXA1204Q	
IC601	8-752-807-12	IC CXP80116-101Q	
IC602	8-759-990-78	IC S-81350AG-REG	
IC603	8-759-987-66	IC TL7757	
IC604	8-759-100-95	IC UPC324G2	
IC605	8-759-030-64	IC MPC1710AM	
IC607	8-759-100-93	IC UPC393G2	

COIL

Ref.No	Part No.	Description	Remark
L101	1-412-033-11	INDUCTOR CHIP 220UH	
L102	1-410-385-11	INDUCTOR CHIP 22UH	
L103	1-412-033-11	INDUCTOR CHIP 220UH	
L104	1-410-385-11	INDUCTOR CHIP 22UH	
L161	1-412-029-11	INDUCTOR CHIP 10UH	
L162	1-412-029-11	INDUCTOR CHIP 10UH	
L191	1-412-033-11	INDUCTOR CHIP 220UH	
L192	1-410-381-11	INDUCTOR CHIP 10UH	
L201	1-410-393-11	INDUCTOR CHIP 100UH	
L202	1-410-393-11	INDUCTOR CHIP 100UH	
L203	1-412-031-11	INDUCTOR CHIP 47UH	
L204	1-412-031-11	INDUCTOR CHIP 47UH	
L205	1-410-388-21	INDUCTOR CHIP 39UH	
L206	1-410-383-31	INDUCTOR CHIP 15UH	
L208	1-410-392-11	INDUCTOR CHIP 82UH	
L209	1-410-385-11	INDUCTOR CHIP 22UH	
L210	1-412-029-11	INDUCTOR CHIP 10UH	
L211	1-410-392-11	INDUCTOR CHIP 82UH	
L212	1-410-393-11	INDUCTOR CHIP 100UH	
L213	1-410-377-31	INDUCTOR CHIP 4.7UH	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
L214	1-408-797-11	INDUCTOR CHIP 470UH	
L215	1-408-795-21	INDUCTOR CHIP 330UH	
L216	1-410-388-21	INDUCTOR CHIP 39UH	
L217	1-408-795-21	INDUCTOR CHIP 330UH	
L218	1-410-393-11	INDUCTOR CHIP 100UH	
L219	1-410-380-31	INDUCTOR CHIP 8.2UH	
L220	1-408-795-21	INDUCTOR CHIP 330UH	
L221	1-410-393-11	INDUCTOR CHIP 100UH	
L222	1-410-393-11	INDUCTOR CHIP 100UH	
L223	1-408-791-00	INDUCTOR CHIP 150UH	
L224	1-410-657-21	INDUCTOR CHIP 180UH	
L225	1-410-387-11	INDUCTOR CHIP 33UH	
L227	1-410-381-11	INDUCTOR CHIP 10UH	
L228	1-412-029-11	INDUCTOR CHIP 10UH	
L229	1-410-393-11	INDUCTOR CHIP 100UH	
L241	1-410-369-11	INDUCTOR CHIP 1UH	
L501	1-410-658-31	INDUCTOR CHIP 220UH	
L502	1-408-795-21	INDUCTOR CHIP 330UH	
L503	1-412-032-11	INDUCTOR CHIP 100UH	
L504	1-412-032-11	INDUCTOR CHIP 100UH	
L601	1-412-031-11	INDUCTOR CHIP 47UH	
L602	1-412-031-11	INDUCTOR CHIP 47UH	

IC LINK

Ref.No	Part No.	Description	Remark
PS601⚠	1-532-605-00	LINK, IC ICP-N10 (0.4A)	
PS602⚠	1-532-685-00	LINK, IC ICP-N20 (0.8A)	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q101	8-729-209-07	TRANSISTOR 2SC4213B	
Q102	8-729-209-07	TRANSISTOR 2SC4213B	
Q103	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q104	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q105	8-729-209-07	TRANSISTOR 2SC4213B	
Q106	8-729-209-07	TRANSISTOR 2SC4213B	
Q107	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q108	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q161	8-729-403-35	TRANSISTOR UN5113	
Q162	8-729-117-32	TRANSISTOR 2SC4177	
Q163	8-729-402-42	TRANSISTOR UN5213	
Q164	8-729-402-42	TRANSISTOR UN5213	
Q165	8-729-402-42	TRANSISTOR UN5213	
Q166	8-729-402-42	TRANSISTOR UN5213	
Q167	8-729-402-42	TRANSISTOR UN5213	
Q191	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q192	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q193	8-729-216-22	TRANSISTOR 2SA1162	
Q201	8-729-104-26	TRANSISTOR 2SB804-AW	
Q202	8-729-117-32	TRANSISTOR 2SC4177	
Q203	8-729-602-36	TRANSISTOR 2SA1602	
Q204	8-729-402-42	TRANSISTOR UN5213	
Q205	8-729-117-32	TRANSISTOR 2SC4177	
Q206	8-729-602-36	TRANSISTOR 2SA1602	
Q207	8-729-140-88	TRANSISTOR FP1A3M	
Q208	8-729-122-63	TRANSISTOR 2SA1226	
Q209	8-729-420-12	TRANSISTOR XN4213	
Q210	8-729-102-08	TRANSISTOR 2SC2223-F14	
Q211	8-729-402-78	TRANSISTOR XN6401	
Q212	8-729-905-23	TRANSISTOR 2SA1576T106R	
Q213	8-729-102-08	TRANSISTOR 2SC2223-F14	
Q214	8-729-142-03	TRANSISTOR 2SC2223-F14	
Q215	8-729-602-36	TRANSISTOR 2SA1602	
Q216	8-729-117-32	TRANSISTOR 2SC4177	
Q217	8-729-117-32	TRANSISTOR 2SC4177	
Q218	8-729-602-36	TRANSISTOR 2SA1602	
Q219	8-729-905-23	TRANSISTOR 2SA1576T106R	
Q220	8-729-117-32	TRANSISTOR 2SC4177	
Q221	8-729-402-42	TRANSISTOR UN5213	
Q224	8-729-403-35	TRANSISTOR UN5113	
Q226	8-729-807-87	TRANSISTOR 2SB1295-UL6	
Q227	8-729-602-36	TRANSISTOR 2SA1602	
Q228	8-729-117-32	TRANSISTOR 2SC4177	
Q229	8-729-907-00	TRANSISTOR DTC114EU	
Q230	8-729-117-32	TRANSISTOR 2SC4177	
Q231	8-729-905-15	TRANSISTOR DTC144WU	
Q232	8-729-602-36	TRANSISTOR 2SA1602	
Q233	8-729-117-32	TRANSISTOR 2SC4177	
Q234	8-729-117-32	TRANSISTOR 2SC4177	
Q235	8-729-602-36	TRANSISTOR 2SA1602	
Q236	8-729-602-36	TRANSISTOR 2SA1602	
Q237	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q238	8-729-102-08	TRANSISTOR 2SC2223-F14	
Q239	8-729-102-08	TRANSISTOR 2SC2223-F14	
Q240	8-729-403-35	TRANSISTOR UN5113	
Q241	8-729-602-36	TRANSISTOR 2SA1602	
Q242	8-729-402-42	TRANSISTOR UN5213	
Q243	8-729-921-08	TRANSISTOR DTC144TU	
Q244	8-729-921-58	TRANSISTOR DTA144TU	
Q245	8-729-102-08	TRANSISTOR 2SC2223-F14	
Q246	8-729-117-32	TRANSISTOR 2SC4177	
Q247	8-729-403-35	TRANSISTOR UN5113	
Q248	8-729-403-35	TRANSISTOR UN5113	
Q249	8-729-420-12	TRANSISTOR XN4213	
Q256	8-729-402-42	TRANSISTOR UN5213	
Q501	8-729-920-39	TRANSISTOR IMT1US	
Q541	8-729-602-36	TRANSISTOR 2SA1602	
Q542	8-729-117-32	TRANSISTOR 2SC4177	
Q543	8-729-602-36	TRANSISTOR 2SA1602	
Q571	8-729-920-39	TRANSISTOR IMT1US	
Q572	8-729-920-39	TRANSISTOR IMT1US	
Q573	8-729-117-32	TRANSISTOR 2SC4177	
Q574	8-729-903-82	TRANSISTOR FMW2	
Q575	8-729-904-04	TRANSISTOR FMS2	
Q576	8-729-117-32	TRANSISTOR 2SC4177	
Q577	8-729-807-16	TRANSISTOR 2SD1621	
Q578	8-729-903-97	TRANSISTOR FMS1FE	
Q579	8-729-602-36	TRANSISTOR 2SA1602	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

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Ref.No	Part No.	Description	Remark
Q601	8-729-403-24	TRANSISTOR XN4210	
Q602	8-729-403-24	TRANSISTOR XN4210	
Q603	8-729-403-24	TRANSISTOR XN4210	
Q604	8-729-403-24	TRANSISTOR XN4210	
Q606	8-729-403-24	TRANSISTOR XN4210	
Q607	8-729-403-24	TRANSISTOR XN4210	
Q608	8-729-403-24	TRANSISTOR XN4210	
Q609	8-729-403-24	TRANSISTOR XN4210	
Q610	8-729-403-24	TRANSISTOR XN4210	
Q611	8-729-420-12	TRANSISTOR XN4213	
Q612	8-729-403-35	TRANSISTOR UN5113	
Q613	8-729-402-42	TRANSISTOR UN5213	
Q614	8-729-903-97	TRANSISTOR FMS1FE	
Q615	8-729-903-82	TRANSISTOR FMW2	
Q616	8-729-117-32	TRANSISTOR 2SC4177	
Q617	8-729-903-97	TRANSISTOR FMS1FE	
Q618	8-729-903-97	TRANSISTOR FMS1FE	
Q619	8-729-907-00	TRANSISTOR DTC114EU	
Q620	8-729-421-90	TRANSISTOR XN4113	
Q621	8-729-420-12	TRANSISTOR XN4213	
Q622	8-729-422-14	TRANSISTOR XN4111	
Q623	8-729-117-32	TRANSISTOR 2SC4177	
Q624	8-729-422-14	TRANSISTOR XN4111	
Q643	8-729-403-24	TRANSISTOR XN4210	
Q644	8-729-403-35	TRANSISTOR UN5113	
Q645	8-729-402-42	TRANSISTOR UN5213	
Q661	8-729-117-32	TRANSISTOR 2SC4177	
Q662	8-729-602-36	TRANSISTOR 2SA1602	
Q663	8-729-117-32	TRANSISTOR 2SC4177	
Q664	8-729-602-36	TRANSISTOR 2SA1602	
Q665	8-729-117-32	TRANSISTOR 2SC4177	
Q681	8-729-117-32	TRANSISTOR 2SC4177	
Q682	8-729-820-46	TRANSISTOR 2SB1202FAS	
Q683	8-729-902-93	TRANSISTOR FMG4	
Q684	8-729-903-97	TRANSISTOR FMS1FE	
		RESISTOR	
R101	1-216-838-11	METAL GLAZE 27K 5% 1/16W	
R102	1-216-827-11	METAL GLAZE 3.3K 5% 1/16W	
R103	1-216-840-11	METAL GLAZE 39K 5% 1/16W	
R104	1-216-841-11	METAL GLAZE 47K 5% 1/16W	
R105	1-216-864-11	METAL GLAZE 0 5% 1/16W	
R106	1-216-839-11	METAL GLAZE 33K 5% 1/16W	
R107	1-216-827-11	METAL GLAZE 3.3K 5% 1/16W	
R108	1-216-840-11	METAL GLAZE 39K 5% 1/16W	
R109	1-216-841-11	METAL GLAZE 47K 5% 1/16W	
R110	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R111	1-216-838-11	METAL GLAZE 27K 5% 1/16W	
R112	1-216-827-11	METAL GLAZE 3.3K 5% 1/16W	
R113	1-216-840-11	METAL GLAZE 39K 5% 1/16W	
R114	1-216-841-11	METAL GLAZE 47K 5% 1/16W	
R115	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R116	1-216-839-11	METAL GLAZE 33K 5% 1/16W	
R117	1-216-827-11	METAL GLAZE 3.3K 5% 1/16W	
R118	1-216-840-11	METAL GLAZE 39K 5% 1/16W	
R119	1-216-841-11	METAL GLAZE 47K 5% 1/16W	
R120	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R121	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R122	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R123	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R124	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R125	1-216-864-11	METAL GLAZE 0 5% 1/16W	
R126	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R127	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R128	1-216-864-11	METAL GLAZE 0 5% 1/16W	
R129	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R130	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R131	1-216-857-11	METAL GLAZE 1M 5% 1/16W	
R132	1-216-857-11	METAL GLAZE 1M 5% 1/16W	
R134	1-216-857-11	METAL GLAZE 1M 5% 1/16W	
R135	1-216-857-11	METAL GLAZE 1M 5% 1/16W	
R139	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R140	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R141	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R142	1-216-864-11	METAL GLAZE 0 5% 1/16W	
R143	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R144	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R161	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R162	1-216-832-11	METAL GLAZE 8.2K 5% 1/16W	
R163	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R164	1-216-841-11	METAL GLAZE 47K 5% 1/16W	
R165	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R166	1-216-832-11	METAL GLAZE 8.2K 5% 1/16W	
R167	1-216-843-11	METAL GLAZE 68K 5% 1/16W	
R168	1-216-828-11	METAL GLAZE 3.9K 5% 1/16W	
R169	1-216-845-11	METAL GLAZE 100K 5% 1/16W	
R170	1-216-847-11	METAL GLAZE 150K 5% 1/16W	
R171	1-216-847-11	METAL GLAZE 150K 5% 1/16W	
R172	1-216-847-11	METAL GLAZE 150K 5% 1/16W	
R173	1-216-824-11	METAL GLAZE 1.8K 5% 1/16W	
R174	1-216-823-11	METAL GLAZE 1.5K 5% 1/16W	
R175	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R176	1-216-791-11	METAL GLAZE 3.3 5% 1/16W	
R177	1-216-791-11	METAL GLAZE 3.3 5% 1/16W	
R191	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R192	1-216-839-11	METAL GLAZE 33K 5% 1/16W	
R193	1-216-814-11	METAL GLAZE 270 5% 1/16W	
R194	1-216-813-11	METAL GLAZE 220 5% 1/16W	
R195	1-216-829-11	METAL GLAZE 4.7K 5% 1/16W	
R196	1-216-803-11	METAL GLAZE 33 5% 1/16W	
R197	1-216-806-11	METAL GLAZE 56 5% 1/16W	
R198	1-216-818-11	METAL GLAZE 560 5% 1/16W	
R199	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R201	1-216-804-11	METAL GLAZE 39 5% 1/16W	
R202	1-216-804-11	METAL GLAZE 39 5% 1/16W	
R203	1-216-821-11	METAL GLAZE 1K 5% 1/16W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R204	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R205	1-216-791-11	METAL GLAZE	3.3	5%	1/16W	
R206	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R207	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R208	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R209	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R210	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R211	1-218-285-11	METAL GLAZE	75	5%	1/16W	
R212	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R213	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R214	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R215	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R216	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R217	1-216-699-11	METAL CHIP	100K	0.50%	1/10W	
R218	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R219	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R220	1-216-814-11	METAL GLAZE	270	5%	1/16W	
R221	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R222	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R223	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R224	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R225	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R226	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R227	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R228	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R229	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R231	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R232	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R233	1-216-844-11	METAL GLAZE	82K	5%	1/16W	
R234	1-216-810-11	METAL GLAZE	120	5%	1/16W	
R235	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R236	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R237	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R238	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R239	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R240	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R241	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R242	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W	
R243	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R244	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R245	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R246	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R247	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R248	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R249	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R250	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R251	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R252	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R253	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R254	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R255	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R256	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R258	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R259	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R260	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R261	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R262	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R263	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R264	1-216-807-11	METAL GLAZE	68	5%	1/16W	
R265	1-216-811-11	METAL GLAZE	150	5%	1/16W	
R266	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R267	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W	
R268	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R269	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R270	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R271	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R272	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R273	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R274	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R275	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R276	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R277	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R278	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R279	1-216-834-11	METAL GLAZE	12K	5%	1/16W	
R280	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R281	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R282	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W	
R283	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R284	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R285	1-216-814-11	METAL GLAZE	270	5%	1/16W	
R286	1-216-666-11	METAL CHIP	4.3K	0.50%	1/10W	
R287	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R288	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R289	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R290	1-216-843-11	METAL GLAZE	68K	5%	1/16W	
R291	1-216-855-11	METAL GLAZE	680K	5%	1/16W	
R293	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R294	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R295	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R296	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R297	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R300	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R301	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R304	1-216-807-11	METAL GLAZE	68	5%	1/16W	
R311	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R316	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R317	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R318	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R319	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R320	1-216-815-11	METAL GLAZE	330	5%	1/16W	
R321	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R325	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R326	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R327	1-216-813-11	METAL GLAZE	220	5%	1/16W	
R328	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R329	1-216-833-11	METAL GLAZE	10K	5%	1/16W	

When indicating parts by reference number, please include the board name.

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Ref.No	Part No.	Description				Remark
R330	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R331	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R332	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R333	1-216-809-11	METAL GLAZE	100	5%	1/16W	
R334	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R338	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R339	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R341	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R342	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R343	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R345	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R351	1-216-810-11	METAL GLAZE	120	5%	1/16W	
R352	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R355	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R356	1-216-807-11	METAL GLAZE	68	5%	1/16W	
R357	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R358	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R360	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R361	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R362	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R363	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R364	1-216-816-11	METAL GLAZE	390	5%	1/16W	
R367	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R380	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R382	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R399	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R501	1-216-336-11	METAL GLAZE	47K	1%	1/10W	
R502	1-216-336-11	METAL GLAZE	47K	1%	1/10W	
R503	1-218-162-11	METAL GLAZE	82K	1%	1/10W	
R504	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R505	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R506	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R507	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R508	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R509	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R510	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R511	1-216-834-11	METAL GLAZE	12K	5%	1/16W	
R512	1-217-671-11	METAL GLAZE	1	5%	1/10W	
R513	1-217-671-11	METAL GLAZE	1	5%	1/10W	
R514	1-217-671-11	METAL GLAZE	1	5%	1/10W	
R515	1-217-671-11	METAL GLAZE	1	5%	1/10W	
R519	1-216-848-11	METAL GLAZE	180K	5%	1/16W	
R520	1-216-805-11	METAL GLAZE	47	5%	1/16W	
R521	1-216-846-11	METAL GLAZE	120K	5%	1/16W	
R522	1-216-847-11	METAL GLAZE	150K	5%	1/16W	
R523	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R524	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R525	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R526	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R527	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R528	1-216-789-11	METAL GLAZE	2.2	5%	1/16W	
R529	1-216-789-11	METAL GLAZE	2.2	5%	1/16W	
R530	1-216-789-11	METAL GLAZE	2.2	5%	1/16W	

Ref.No	Part No.	Description				Remark
R531	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R532	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R533	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R534	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R535	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R543	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R544	1-216-814-11	METAL GLAZE	270	5%	1/16W	
R545	1-216-812-11	METAL GLAZE	180	5%	1/16W	
R547	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R548	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R549	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R550	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R551	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R552	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R553	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R554	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R555	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R556	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R557	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R558	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R559	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R571	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R572	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R573	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R574	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R575	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R576	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R577	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R578	1-216-843-11	METAL GLAZE	68K	5%	1/16W	
R579	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R580	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R581	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R582	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R583	1-216-809-11	METAL GLAZE	100	5%	1/16W	
R584	1-216-017-00	METAL GLAZE	47	5%	1/10W	
R585	1-216-174-00	METAL GLAZE	100	5%	1/8W	
R586	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R587	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R588	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R589	1-216-689-11	METAL CHIP	39K	0.50%	1/10W	
R590	1-216-655-11	METAL CHIP	1.5K	0.50%	1/10W	
R591	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R592	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R604	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R605	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R610	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R611	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R612	1-216-852-11	METAL GLAZE	390K	5%	1/16W	
R613	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R614	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R615	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R616	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R617	1-216-857-11	METAL GLAZE	1M	5%	1/16W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
R618	1-216-839-11	METAL GLAZE 33K 5% 1/16W	
R619	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R620	1-216-844-11	METAL GLAZE 82K 5% 1/16W	
R621	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R622	1-216-844-11	METAL GLAZE 82K 5% 1/16W	
R625	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R626	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R627	1-216-817-11	METAL GLAZE 470 5% 1/16W	
R633	1-216-176-00	METAL GLAZE 120 5% 1/8W	
R634	1-216-174-00	METAL GLAZE 100 5% 1/8W	
R635	1-216-845-11	METAL GLAZE 100K 5% 1/16W	
R645	1-216-845-11	METAL GLAZE 100K 5% 1/16W	
R646	1-216-845-11	METAL GLAZE 100K 5% 1/16W	
R647	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R648	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R661	1-216-839-11	METAL GLAZE 33K 5% 1/16W	
R662	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R663	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R664	1-216-807-11	METAL GLAZE 68 5% 1/16W	
R665	1-216-811-11	METAL GLAZE 150 5% 1/16W	
R666	1-216-831-11	METAL GLAZE 6.8K 5% 1/16W	
R667	1-216-844-11	METAL GLAZE 82K 5% 1/16W	
R668	1-216-857-11	METAL GLAZE 1M 5% 1/16W	
R669	1-216-838-11	METAL GLAZE 27K 5% 1/16W	
R670	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R671	1-216-838-11	METAL GLAZE 27K 5% 1/16W	
R672	1-216-859-11	METAL GLAZE 1.5M 5% 1/16W	
R673	1-216-851-11	METAL GLAZE 330K 5% 1/16W	
R674	1-216-851-11	METAL GLAZE 330K 5% 1/16W	
R675	1-216-857-11	METAL GLAZE 1M 5% 1/16W	
R678	1-216-847-11	METAL GLAZE 150K 5% 1/16W	
R679	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R681	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R682	1-216-816-11	METAL GLAZE 390 5% 1/16W	
R683	1-216-194-00	METAL GLAZE 680 5% 1/8W	
R684	1-216-194-00	METAL GLAZE 680 5% 1/8W	
R685	1-216-194-00	METAL GLAZE 680 5% 1/8W	
R686	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R688	1-216-841-11	METAL GLAZE 47K 5% 1/16W	
R689	1-216-822-11	METAL GLAZE 1.2K 5% 1/16W	
R690	1-216-827-11	METAL GLAZE 3.3K 5% 1/16W	
R691	1-216-835-11	METAL GLAZE 15K 5% 1/16W	
R695	1-216-822-11	METAL GLAZE 1.2K 5% 1/16W	
R696	1-217-671-11	METAL GLAZE 1 5% 1/10W	
R697	1-217-671-11	METAL GLAZE 1 5% 1/10W	

NETWORK RESISTOR

Ref.No	Part No.	Description	Remark
RB101	1-236-420-11	NETWORK, RES 4.7K	
RB102	1-236-420-11	NETWORK, RES 4.7K	
RB107	1-236-420-11	NETWORK, RES 4.7K	
RB108	1-236-420-11	NETWORK, RES 4.7K	
RB201	1-236-424-11	NETWORK, RES 10K	
RB212	1-236-424-11	NETWORK, RES 10K	
RB213	1-236-412-11	NETWORK, RES 1.0K	
RB214	1-236-408-11	NETWORK, RES 470	
RB216	1-236-409-11	NETWORK, RES 560	
RB501	1-236-432-11	NETWORK, RES 47K	
RB502	1-236-424-11	NETWORK, RES 10K	
RB541	1-236-408-11	NETWORK, RES 470	
RB542	1-236-418-11	NETWORK, RES 3.3K	
RB543	1-236-418-11	NETWORK, RES 3.3K	
RB601	1-236-436-11	NETWORK, RES 100K	
RB602	1-236-436-11	NETWORK, RES 100K	
RB603	1-236-436-11	NETWORK, RES 100K	
RB604	1-236-436-11	NETWORK, RES 100K	
RB605	1-236-436-11	NETWORK, RES 100K	
RB606	1-236-436-11	NETWORK, RES 100K	
RB607	1-236-436-11	NETWORK, RES 100K	
RB608	1-236-436-11	NETWORK, RES 100K	
RB609	1-236-436-11	NETWORK, RES 100K	
RB610	1-236-424-11	NETWORK, RES 10K	
RB611	1-236-424-11	NETWORK, RES 10K	
RB612	1-236-424-11	NETWORK, RES 10K	
RB613	1-236-424-11	NETWORK, RES 10K	
RB614	1-236-424-11	NETWORK, RES 10K	
RB615	1-236-436-11	NETWORK, RES 100K	
RB616	1-236-424-11	NETWORK, RES 10K	
RB617	1-236-431-11	NETWORK, RES 39K	
RB618	1-236-432-11	NETWORK, RES 47K	
RB619	1-236-424-11	NETWORK, RES 10K	
RB620	1-236-408-11	NETWORK, RES 470	
RB621	1-236-408-11	NETWORK, RES 470	
RB661	1-236-424-11	NETWORK, RES 10K	
RB662	1-236-436-11	NETWORK, RES 100K	
RB681	1-236-424-11	NETWORK, RES 10K	
RB682	1-236-424-11	NETWORK, RES 10K	

VARIABLE RESISTOR

Ref.No	Part No.	Description	Remark
RV101	1-238-089-11	RES, ADJ CERMET 4.7K	
RV102	1-238-089-11	RES, ADJ CERMET 4.7K	
RV103	1-238-089-11	RES, ADJ CERMET 4.7K	
RV104	1-238-089-11	RES, ADJ CERMET 4.7K	
RV111	1-238-092-11	RES, ADJ CERMET 47K	
RV112	1-238-092-11	RES, ADJ CERMET 47K	
RV113	1-238-092-11	RES, ADJ CERMET 47K	
RV114	1-238-092-11	RES, ADJ CERMET 47K	
RV201	1-238-092-11	RES, ADJ CERMET 47K	
RV202	1-238-087-11	RES, ADJ CERMET 1K	
RV203	1-238-088-11	RES, ADJ, CERMET 2.2K	
RV204	1-238-089-11	RES, ADJ CERMET 4.7K	
RV205	1-238-087-11	RES, ADJ CERMET 1K	
RV206	1-238-092-11	RES, ADJ CERMET 47K	
RV207	1-238-090-11	RES, ADJ CERMET 10K	
RV208	1-238-087-11	RES, ADJ CERMET 1K	
RV209	1-238-087-11	RES, ADJ CERMET 1K	
RV210	1-238-087-11	RES, ADJ CERMET 1K	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description		Remark
RV501	1-238-091-11	RES, ADJ CERMET 10K		
RV502	1-238-095-11	RES, ADJ CERMET 470K		
RV602	1-238-092-11	RES, ADJ CERMET 47K		

FLEXIBLE BOARD

Ref.No	Part No.	Description
W604	1-630-592-11	FP-184 FLEXIBLE BOARD

CRYSTAL

Ref.No	Part No.	Description
X201	1-577-080-11	VIBRATOR, CRYSTAL
X501	1-577-350-21	VIBRATOR, CRYSTAL (5.94755MHz)
X601	1-577-349-21	VIBRATOR, CRYSTAL (16MHz)

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A-7061-661-A AU-51 BOARD, COMPLETE (Ref.No 3,000 Series)
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CAPACITOR

Ref.No	Part No.	Description		Remark
C421	1-126-206-11	ELECT CHIP 100MF	20%	6.3V
C422	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C423	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C424	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C425	1-162-969-11	CERAMIC CHIP 0.0068MF	10%	25V
C426	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C427	1-162-967-11	CERAMIC CHIP 0.0033MF	10%	50V
C428	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C429	1-126-205-11	ELECT CHIP 47MF	20%	6.3V
C430	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C431	1-126-199-11	ELECT CHIP 6.8MF	20%	35V
C432	1-126-205-11	ELECT CHIP 47MF	20%	6.3V
C433	1-126-206-11	ELECT CHIP 100MF	20%	6.3V
C434	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C435	1-126-206-11	ELECT CHIP 100MF	20%	6.3V
C436	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C437	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C438	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C439	1-135-149-21	TANTAL. CHIP 2.2MF	20%	10V
C440	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C441	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C442	1-164-227-11	CERAMIC CHIP 0.022MF	10%	25V
C443	1-162-957-11	CERAMIC CHIP 220PF	5%	50V
C444	1-135-145-11	TANTAL. CHIP 0.47MF	20%	35V
C445	1-162-965-11	CERAMIC CHIP 0.0015MF	10%	50V
C446	1-163-016-00	CERAMIC CHIP 0.0039MF	10%	50V
C447	1-162-957-11	CERAMIC CHIP 220PF	5%	50V
C448	1-162-966-11	CERAMIC CHIP 0.0022MF	10%	50V
C449	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C450	1-162-910-11	CERAMIC CHIP 5PF	0.25PF	50V
C451	1-163-133-00	CERAMIC CHIP 470PF	5%	50V
C452	1-162-910-11	CERAMIC CHIP 5PF	0.25PF	50V
C453	1-162-968-11	CERAMIC CHIP 0.0047MF	10%	50V
C454	1-162-957-11	CERAMIC CHIP 220PF	5%	50V
C455	1-162-587-91	CERAMIC CHIP 0.039MF	10%	25V
C456	1-162-963-11	CERAMIC CHIP 680PF	10%	50V
C457	1-163-020-00	CERAMIC CHIP 0.0082MF	10%	50V
C458	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C459	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C460	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C461	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C462	1-135-149-21	TANTAL. CHIP 2.2MF	20%	10V
C463	1-126-205-11	ELECT CHIP 47MF	20%	6.3V
C464	1-126-205-11	ELECT CHIP 47MF	20%	6.3V
C465	1-162-955-11	CERAMIC CHIP 150PF	5%	50V
C466	1-162-966-11	CERAMIC CHIP 0.0022MF	10%	50V
C467	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C469	1-162-957-11	CERAMIC CHIP 220PF	5%	50V
C470	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C471	1-162-953-11	CERAMIC CHIP 100PF	5%	50V

CONNECTOR

Ref.No	Part No.	Description
CN401	1-568-365-41	CONNECTOR, BOARD TO BOARD 14P
CN402	*1-566-758-11	PIN, CONNECTOR (PC BOARD) 3P
CN403	1-566-757-11	PIN, CONNECTOR (PC BOARD) 2P

DIODE

Ref.No	Part No.	Description
D402	8-719-420-15	DIODE MA8082-M

FILTER

Ref.No	Part No.	Description
FL401	1-236-145-11	FILTER, BAND PASS

IC

Ref.No	Part No.	Description
IC401	8-752-033-01	IC CXA1237AR

COIL

Ref.No	Part No.	Description
L401	1-412-032-11	INDUCTOR CHIP 100UH
L402	1-410-658-31	INDUCTOR CHIP 220UH

TRANSISTOR

Ref.No	Part No.	Description
Q406	8-729-117-32	TRANSISTOR 2SC4177
Q407	8-729-905-15	TRANSISTOR DTC144WU
Q408	8-729-220-93	TRANSISTOR 2SK209G
Q409	8-729-117-32	TRANSISTOR 2SC4177
Q410	8-729-117-32	TRANSISTOR 2SC4177
Q411	8-729-905-15	TRANSISTOR DTC144WU
Q412	8-729-905-09	TRANSISTOR DTA144WU
Q413	8-729-117-32	TRANSISTOR 2SC4177
Q414	8-729-905-09	TRANSISTOR DTA144WU
Q415	8-729-821-88	TRANSISTOR 2SK1332-3
Q416	8-729-117-32	TRANSISTOR 2SC4177
Q417	8-729-602-36	TRANSISTOR 2SA1602
Q418	8-729-602-36	TRANSISTOR 2SA1602
Q419	8-729-117-32	TRANSISTOR 2SC4177

RESISTOR

Ref.No	Part No.	Description		
R421	1-216-841-11	METAL GLAZE 47K	5%	1/16W

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R422	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W	
R423	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R424	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R425	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R426	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R427	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R428	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R429	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R430	1-216-849-11	METAL GLAZE	220K	5%	1/16W	
R431	1-216-853-11	METAL GLAZE	470K	5%	1/16W	
R432	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R433	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R434	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R435	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R436	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R437	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R438	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R439	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W	
R440	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R441	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R442	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R443	1-216-801-11	METAL GLAZE	22	5%	1/16W	
R444	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R445	1-216-851-11	METAL GLAZE	330K	5%	1/16W	
R446	1-216-843-11	METAL GLAZE	68K	5%	1/16W	
R447	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R448	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R449	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R450	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R451	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R452	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R453	1-216-649-11	METAL CHIP	820	0.50%	1/10W	
R454	1-216-649-11	METAL CHIP	820	0.50%	1/10W	
R455	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R456	1-216-834-11	METAL GLAZE	12K	5%	1/16W	
R457	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R458	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R459	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W	
R460	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W	
R461	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R462	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R463	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R464	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R465	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R466	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R467	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R468	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R469	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R470	1-216-814-11	METAL GLAZE	270	5%	1/16W	
R471	1-216-810-11	METAL GLAZE	120	5%	1/16W	
R472	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R473	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R474	1-216-037-00	METAL GLAZE	330	5%	1/10W	

Ref.No	Part No.	Description				Remark
R475	1-216-817-11	METAL GLAZE	470	5%	1/16W	

VARIABLE RESISTOR

Ref.No	Part No.	Description
RV401	1-238-090-11	RES, ADJ CERMET 10K
RV402	1-238-091-11	RES, ADJ CERMET 22K

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A-7061-663-A TI-15 BOARD, COMPLETE (Ref.No 4,000 Series)
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CAPACITOR

Ref.No	Part No.	Description		
C801	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C802	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C803	1-162-637-11	CERAMIC CHIP 0.47MF		16V
C804	1-162-913-11	CERAMIC CHIP 8PF	0.5PF	50V
C805	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C807	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C808	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C810	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C811	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C812	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C813	1-162-949-11	CERAMIC CHIP 47PF	5%	50V
C814	1-162-949-11	CERAMIC CHIP 47PF	5%	50V
C815	1-162-949-11	CERAMIC CHIP 47PF	5%	50V
C816	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C817	1-162-921-11	CERAMIC CHIP 33PF	5%	50V
C818	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C819	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V

CONNECTOR

Ref.No	Part No.	Description
CN801	1-568-368-41	CONNECTOR, BOARD TO BOARD 20P

TRIMMER

Ref.No	Part No.	Description
CT801	1-141-368-11	CAP, CHIP TRIMMER (30P)
CT802	1-141-368-11	CAP, CHIP TRIMMER (30P)

DIODE

Ref.No	Part No.	Description
D801	8-713-300-88	DIODE 1T33C-01

IC

Ref.No	Part No.	Description
IC801	8-759-979-76	IC MB8464A-15LLPF
IC802	8-759-140-26	IC UPD6145G-601
IC803	8-759-971-81	IC MB670479U

COIL

Ref.No	Part No.	Description
L801	1-410-377-31	INDUCTOR CHIP 4.7UH
L802	1-410-384-11	INDUCTOR CHIP 18UH
L803	1-410-390-11	INDUCTOR CHIP 56UH
L804	1-410-381-11	INDUCTOR CHIP 10UH

When indicating parts by reference number, please include the board name.

TI-15 LD-11

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q801	8-729-905-18	TRANSISTOR DTC144EU	
Q802	8-729-403-24	TRANSISTOR XN4210	
Q803	8-729-402-19	TRANSISTOR XN6501	

RESISTOR

Ref.No	Part No.	Description	Remark
R801	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R803	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R805	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R806	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R810	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R812	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R815	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R816	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R817	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R818	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R819	1-216-829-11	METAL GLAZE 4.7K 5% 1/16W	
R820	1-216-845-11	METAL GLAZE 100K 5% 1/16W	
R821	1-216-845-11	METAL GLAZE 100K 5% 1/16W	
R822	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R823	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R824	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R825	1-216-845-11	METAL GLAZE 100K 5% 1/16W	
R826	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R827	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R828	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R829	1-216-825-11	METAL GLAZE 2.2K 5% 1/16W	
R830	1-216-817-11	METAL GLAZE 470 5% 1/16W	
R831	1-216-817-11	METAL GLAZE 470 5% 1/16W	
R832	1-216-833-11	METAL GLAZE 10K 5% 1/16W	

NETWORK RESISTOR

Ref.No	Part No.	Description	Remark
RB801	1-236-424-11	NETWORK, RES 10K	
RB802	1-236-424-11	NETWORK, RES 10K	
RB803	1-236-432-11	NETWORK, RES 47K	
RB804	1-236-424-11	NETWORK, RES 10K	

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A-7061-664-A LD-11 BOARD, COMPLETE (Ref.No 3,000 Series)
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CAPACITOR

Ref.No	Part No.	Description	Remark
C701	1-135-155-21	TANTAL. CHIP 4.7MF 20%	16V
C702	1-162-974-11	CERAMIC CHIP 0.01MF	50V
C703	1-164-227-11	CERAMIC CHIP 0.022MF 10%	25V
C704	1-135-157-21	TANTAL. CHIP 10MF 20%	6.3V
C705	1-162-970-11	CERAMIC CHIP 0.01MF 10%	25V
C707	1-162-970-11	CERAMIC CHIP 0.01MF 10%	25V
C708	1-162-970-11	CERAMIC CHIP 0.01MF 10%	25V
C709	1-162-970-11	CERAMIC CHIP 0.01MF 10%	25V
C710	1-135-155-21	TANTAL. CHIP 4.7MF 20%	16V
C711	1-162-974-11	CERAMIC CHIP 0.01MF	50V
C712	1-162-638-11	CERAMIC CHIP 1MF	16V
C713	1-162-964-11	CERAMIC CHIP 0.001MF 10%	50V
C714	1-162-637-11	CERAMIC CHIP 0.47MF	16V
C715	1-164-156-11	CERAMIC CHIP 0.1MF	25V
C716	1-164-156-11	CERAMIC CHIP 0.1MF	25V
C717	1-162-970-11	CERAMIC CHIP 0.01MF 10%	25V
C718	1-162-966-11	CERAMIC CHIP 0.0022MF 10%	50V
C719	1-162-966-11	CERAMIC CHIP 0.0022MF 10%	50V
C720	1-164-156-11	CERAMIC CHIP 0.1MF	25V
C721	1-162-968-11	CERAMIC CHIP 0.0047MF 10%	50V

CONNECTOR

Ref.No	Part No.	Description	Remark
CN701	1-568-336-11	CONNECTOR, BOARD TO BOARD 20P	
CN702	1-566-540-11	CONNECTOR, FPC (NON ZIF) 8P	
CN703	*1-565-543-11	PIN, CONNECTOR (PC BOARD) 4P	
CN704	*1-565-542-21	PIN, CONNECTOR (PC BOARD) 3P	
CN705	*1-565-542-11	PIN, CONNECTOR (PC BOARD) 3P	

DIODE

Ref.No	Part No.	Description	Remark
D701	8-719-404-46	DIODE MA110	

IC

Ref.No	Part No.	Description	Remark
IC701	8-759-231-23	IC TK10500M	
IC702	8-759-100-94	IC UPC358G2	
IC703	8-759-030-35	IC MPC1725M	
IC704	8-759-981-82	IC RC3414M	

IC LINK

Ref.No	Part No.	Description	Remark
PS701⚠	1-532-605-00	LINK, IC (0.4A)	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q701	8-729-402-78	TRANSISTOR XN6401	
Q702	8-729-907-00	TRANSISTOR DTC114EU	
Q703	8-729-402-42	TRANSISTOR UN5213	
Q704	8-729-402-78	TRANSISTOR XN6401	
Q705	8-729-805-27	TRANSISTOR 2SB1121	
Q706	8-729-117-32	TRANSISTOR 2SC4177	
Q707	8-729-905-15	TRANSISTOR DTC144WU	
Q708	8-729-402-84	TRANSISTOR XN4601	
Q709	8-729-402-84	TRANSISTOR XN4601	

RESISTOR

Ref.No	Part No.	Description	Remark
R701	1-216-298-00	METAL GLAZE 2.2 5% 1/10W	
R702	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R703	1-216-828-11	METAL GLAZE 3.9K 5% 1/16W	
R704	1-216-839-11	METAL GLAZE 33K 5% 1/16W	
R705	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R706	1-216-835-11	METAL GLAZE 15K 5% 1/16W	
R707	1-216-835-11	METAL GLAZE 15K 5% 1/16W	
R708	1-216-828-11	METAL GLAZE 3.9K 5% 1/16W	
R709	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R710	1-216-298-00	METAL GLAZE 2.2 5% 1/10W	
R711	1-216-833-11	METAL GLAZE 10K 5% 1/16W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description			Remark
R712	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R713	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R714	1-216-843-11	METAL GLAZE	68K	5%	1/16W
R715	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R717	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R718	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R719	1-216-309-00	METAL GLAZE	5.6	5%	1/10W
R720	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R721	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R722	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R723	1-216-842-11	METAL GLAZE	56K	5%	1/16W
R724	1-216-809-11	METAL GLAZE	100	5%	1/16W
R725	1-216-857-11	METAL GLAZE	1M	5%	1/16W
R726	1-216-857-11	METAL GLAZE	1M	5%	1/16W
R730	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R731	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W
R732	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R733	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W
R734	1-216-840-11	METAL GLAZE	39K	5%	1/16W
R739	1-216-840-11	METAL GLAZE	39K	5%	1/16W
R740	1-216-839-11	METAL GLAZE	33K	5%	1/16W
R741	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W
R742	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W
R743	1-216-296-00	METAL GLAZE	0	5%	1/8W

NETWORK RESISTOR

RB701 1-236-424-11 NETWORK, RES 10K

VARIABLE RESISTOR

RV701 1-238-094-11 RES, ADJ CERMET 220K

FLEXIBLE BOARD

W701 1-630-595-11 FP-187 FLEXIBLE BOARD

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*A-7061-782-A VC-60 BOARD, COMPLETE (Ref.No 2,000 Series)
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A-7068-153-A DT-74 BOARD, COMPLETE (HIC)

1-630-593-11 FP-185 FLEXIBLE BOARD
1-630-594-11 FP-186 FLEXIBLE BOARD

CAPACITOR

Ref.No	Part No.	Description		Remark
C102	1-135-162-21	TANTAL. CHIP 33MF	20%	6.3V
C103	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C104	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C105	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C108	1-126-205-11	ELECT CHIP 47MF	20%	6.3V
C109	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C110	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C111	1-162-941-11	CERAMIC CHIP 10PF	0.5PF	50V
C131	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C132	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C133	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C134	1-135-079-21	TANTAL. CHIP 3.3MF	20%	35V
C135	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C141	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C142	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C143	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C145	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C146	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C150	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C156	1-162-910-11	CERAMIC CHIP 5PF	0.25PF	50V
C157	1-162-910-11	CERAMIC CHIP 5PF	0.25PF	50V
C181	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C182	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C183	1-162-950-11	CERAMIC CHIP 56PF	5%	50V
C184	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C185	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C186	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C187	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C188	1-162-949-11	CERAMIC CHIP 47PF	5%	50V
C189	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C190	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C191	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C192	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C193	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C194	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C195	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C196	1-164-217-11	CERAMIC CHIP 150PF	0.25PF	50V
C197	1-162-922-11	CERAMIC CHIP 39PF	5%	50V
C198	1-162-957-11	CERAMIC CHIP 220PF	5%	50V
C199	1-162-925-11	CERAMIC CHIP 68PF	5%	50V
C200	1-162-919-11	CERAMIC CHIP 22PF	5%	50V
C201	1-162-945-11	CERAMIC CHIP 22PF	5%	50V
C202	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C203	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C204	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C205	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C206	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C207	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C208	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C209	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C210	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C211	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C212	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C213	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C214	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C215	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C216	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C217	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C219	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C220	1-162-638-11	CERAMIC CHIP 1MF		16V
C221	1-135-147-21	TANTAL. CHIP 1MF	20%	20V

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description		Remark
C222	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C223	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C224	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C225	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C227	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C228	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C229	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C230	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C231	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C232	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C233	1-162-942-11	CERAMIC CHIP 12PF	5%	50V
C234	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C235	1-162-638-11	CERAMIC CHIP 1MF		16V
C236	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C237	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C238	1-162-928-11	CERAMIC CHIP 120PF	5%	50V
C239	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C241	1-162-956-11	CERAMIC CHIP 180PF	5%	50V
C252	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C253	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C254	1-164-005-11	CERAMIC CHIP 0.47MF		25V
C255	1-164-005-11	CERAMIC CHIP 0.47MF		25V
C256	1-164-005-11	CERAMIC CHIP 0.47MF		25V
C257	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C258	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C259	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C260	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C261	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C262	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C263	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C264	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C265	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C266	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C267	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C268	1-162-638-11	CERAMIC CHIP 1MF		16V
C269	1-162-638-11	CERAMIC CHIP 1MF		16V
C270	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C271	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C272	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C273	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C274	1-162-955-11	CERAMIC CHIP 150PF	5%	50V
C275	1-162-946-11	CERAMIC CHIP 27PF	5%	50V
C276	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C277	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C278	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C279	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C281	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C282	1-162-955-11	CERAMIC CHIP 150PF	5%	50V
C283	1-162-946-11	CERAMIC CHIP 27PF	5%	50V
C301	1-162-943-11	CERAMIC CHIP 15PF	5%	50V
C303	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C304	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C305	1-135-147-21	TANTAL. CHIP 1MF	20%	20V

Ref.No	Part No.	Description		Remark
C306	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C307	1-162-915-11	CERAMIC CHIP 10PF	0.5PF	50V
C308	1-164-005-11	CERAMIC CHIP 0.47MF		25V
C309	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C310	1-164-005-11	CERAMIC CHIP 0.47MF		25V
C311	1-162-915-11	CERAMIC CHIP 10PF	0.5PF	50V
C313	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C314	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C315	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C316	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C317	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C318	1-124-566-11	ELECT 120MF	20%	6.3V
C319	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C320	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C321	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C322	1-162-638-11	CERAMIC CHIP 1MF		16V
C323	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C324	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C325	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C326	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C327	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C330	1-162-962-11	CERAMIC CHIP 470PF	10%	50V
C331	1-162-926-11	CERAMIC CHIP 82PF	5%	50V
C332	1-162-919-11	CERAMIC CHIP 22PF	5%	50V
C333	1-162-916-11	CERAMIC CHIP 12PF	5%	50V
C334	1-135-161-21	TANTAL. CHIP 22MF	20%	10V
C336	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C337	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C338	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C339	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C340	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C341	1-162-949-11	CERAMIC CHIP 47PF	5%	50V
C362	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C363	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C364	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C365	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C366	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C367	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C368	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C369	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C370	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C371	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C372	1-135-072-21	TANTAL. CHIP 0.22MF	20%	35V
C373	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C374	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C375	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C376	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C377	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C378	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C379	1-135-145-11	TANTAL. CHIP 0.47MF	20%	35V
C380	1-163-115-00	CERAMIC CHIP 82PF	5%	50V
C401	1-162-966-11	CERAMIC CHIP 0.0022MF	10%	50V
C402	1-162-966-11	CERAMIC CHIP 0.0022MF	10%	50V

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description		Remark
C403	1-162-966-11	CERAMIC CHIP 0.0022MF	10%	50V
C404	1-162-966-11	CERAMIC CHIP 0.0022MF	10%	50V
C416	1-162-949-11	CERAMIC CHIP 47PF	5%	50V
C417	1-162-927-11	CERAMIC CHIP 100PF	5%	50V
C501	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C502	1-162-957-11	CERAMIC CHIP 220PF	5%	50V
C503	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C504	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C505	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C506	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C507	1-162-962-11	CERAMIC CHIP 470PF	10%	50V
C508	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C509	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C510	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C511	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C512	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C513	1-162-913-11	CERAMIC CHIP 8PF	0.5PF	50V
C514	1-162-910-11	CERAMIC CHIP 5PF	0.25PF	50V
C515	1-162-919-11	CERAMIC CHIP 22PF	5%	50V
C516	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C517	1-135-149-21	TANTAL. CHIP 2.2MF	20%	6.3V
C518	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C519	1-162-923-11	CERAMIC CHIP 47PF	5%	50V
C520	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C521	1-163-131-00	CERAMIC CHIP 390PF	5%	50V
C522	1-162-959-11	CERAMIC CHIP 330PF	5%	50V
C523	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C524	1-162-947-11	CERAMIC CHIP 33PF	5%	50V
C525	1-162-954-11	CERAMIC CHIP 120PF	5%	50V
C526	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C528	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C530	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C536	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C537	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C538	1-164-227-11	CERAMIC CHIP 0.022MF	10%	25V
C539	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C540	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C541	1-162-944-11	CERAMIC CHIP 18PF	5%	50V
C545	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C561	1-162-921-11	CERAMIC CHIP 33PF	5%	50V
C562	1-162-916-11	CERAMIC CHIP 12PF	5%	50V
C563	1-162-638-11	CERAMIC CHIP 1MF		16V
C565	1-135-149-21	TANTAL. CHIP 2.2MF	20%	6.3V
C566	1-135-149-21	TANTAL. CHIP 2.2MF	20%	6.3V
C567	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C569	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C570	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C571	1-164-227-11	CERAMIC CHIP 0.022MF	10%	25V
C572	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C611	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C612	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C613	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C614	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C616	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C617	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C618	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C619	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C620	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C621	1-162-941-11	CERAMIC CHIP 10PF	0.5PF	50V
C622	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C623	1-162-957-11	CERAMIC CHIP 220PF	5%	50V
C624	1-162-957-11	CERAMIC CHIP 220PF	5%	50V
C625	1-162-928-11	CERAMIC CHIP 120PF	5%	50V
C626	1-162-926-11	CERAMIC CHIP 82PF	5%	50V
C627	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C628	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C629	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C631	1-162-966-11	CERAMIC CHIP 0.0022MF	10%	50V
C632	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C633	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C634	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C636	1-162-637-11	CERAMIC CHIP 0.47MF		16V
C637	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C638	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C639	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C640	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C641	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C642	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C643	1-162-957-11	CERAMIC CHIP 220PF	5%	50V
C644	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C647	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C648	1-126-416-11	ELECT 220MF	20%	10V

CONNECTOR

CN302	1-568-333-11	CONNECTOR, BOARD TO BOARD 14P
CN303	1-568-326-11	CONNECTOR, BOARD TO BOARD 7P
CN304	*1-565-543-11	PIN, CONNECTOR (PC BOARD) 4P
CN801	1-568-327-11	CONNECTOR, BOARD TO BOARD 8P
CN802	1-568-366-41	CONNECTOR, BOARD TO BOARD 16P
CN803	1-568-336-11	CONNECTOR, BOARD TO BOARD 20P
CN804	1-568-366-41	CONNECTOR, BOARD TO BOARD 16P
CN805	1-568-359-41	CONNECTOR, BOARD TO BOARD 20P
CN806	1-568-367-41	CONNECTOR, BOARD TO BOARD 18P

TRIMMER

CT141	1-141-368-11	CAP, CHIP TRIMMER (30P)
CT561	1-141-368-11	CAP, CHIP TRIMMER (30P)

DIODE

D101	8-719-404-46	DIODE MA110
D102	8-719-404-46	DIODE MA110
D131	8-719-404-32	DIODE MA141WA
D132	8-719-404-46	DIODE MA110
D141	8-719-924-40	DIODE 1T32-T8
D143	8-719-404-46	DIODE MA110
D301	8-719-404-46	DIODE MA110

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
D361	8-719-404-32	DIODE MA141WA	
D362	8-719-404-46	DIODE MA110	
D561	8-719-404-49	DIODE MA111	
D562 ⚠	8-719-420-51	DIODE MA729	
D564	8-719-404-46	DIODE MA110	
D566 ⚠	8-719-420-51	DIODE MA729	
		FILTER	
FL181	1-236-189-11	FILTER, LOW PASS	
FL182	1-236-374-11	LPF, YDL	
FL183	1-236-375-11	LPF, YDL	
FL301	1-236-192-11	FILTER, LOW PASS	
FL303	1-415-695-11	DL, LC	
FL304	1-236-206-11	FILTER, BAND PASS	
FL501	1-236-451-11	BPF	
FL502	1-415-660-21	DL, LC	
FL503	1-236-450-11	LPF	
FL504	1-236-452-11	BPF	
FL610	1-236-209-11	FILTER, LOW PASS	
		IC	
IC141	8-752-329-55	IC CXD1209Q-T3	
IC181	8-752-034-18	IC CXA1338R-T3	
IC182	8-752-333-16	IC CXL1503N-T3	
IC183	8-752-331-33	IC CXL1504N-T3	
IC252	8-759-946-00	IC MB88341PFV-T3	
IC253	8-752-032-48	IC CXA1157M-T1	
IC301	8-752-033-34	IC CXA1072R-T3	
IC302	8-759-946-00	IC MB88341PFV-T3	
IC303	8-759-106-53	IC UPC311G2-T1	
IC361	8-759-031-48	IC MC68HC05N4-SC406656	
IC362	8-759-937-56	IC S-8054ALB-LM-T1	
IC362	8-759-983-34	IC SCI7701YMA-T1	
IC363	8-759-108-38	IC UPD4066BG-T1	
IC364	8-759-103-94	IC UPC324G2-T1	
IC501	8-759-144-23	IC UPC1037GR-T1	
IC502	8-759-144-23	IC UPC1037GR-T1	
IC503	8-752-031-66	IC CXA1047M-T1	
IC561	8-759-146-13	IC UPD7503GF-J36-3B8	
IC610	8-752-329-47	IC CXD1172M-T1	
IC611	8-759-946-00	IC MB88341PFV-T3	
IC612	8-752-326-18	IC CXD1204R-T3	
IC613	8-759-031-79	IC MC68HC05C4-SC403780	
IC615	8-759-103-79	IC UPC358G2-T1	
		COIL	
L101	1-412-029-11	INDUCTOR CHIP 10UH	
L102	1-412-029-11	INDUCTOR CHIP 10UH	
L141	1-410-391-11	INDUCTOR CHIP 68UH	
L142	1-410-381-11	INDUCTOR CHIP 10UH	
L143	1-410-381-11	INDUCTOR CHIP 10UH	
L181	1-410-381-11	INDUCTOR CHIP 10UH	

Ref.No	Part No.	Description	Remark
L182	1-410-381-11	INDUCTOR CHIP 10UH	
L183	1-410-381-11	INDUCTOR CHIP 10UH	
L251	1-410-381-11	INDUCTOR CHIP 10UH	
L301	1-410-381-11	INDUCTOR CHIP 10UH	
L302	1-410-657-21	INDUCTOR CHIP 180UH	
L303	1-410-204-31	INDUCTOR CHIP 10UH	
L361	1-410-381-11	INDUCTOR CHIP 10UH	
L362	1-410-381-11	INDUCTOR CHIP 10UH	
L401	1-410-192-51	INDUCTOR CHIP 1UH	
L402	1-410-192-51	INDUCTOR CHIP 1UH	
L403	1-412-026-11	INDUCTOR CHIP 1UH	
L404	1-410-192-51	INDUCTOR CHIP 1UH	
L501	1-410-381-11	INDUCTOR CHIP 10UH	
L502	1-410-658-31	INDUCTOR CHIP 220UH	
L503	1-410-388-21	INDUCTOR CHIP 39UH	
L509	1-410-381-11	INDUCTOR CHIP 10UH	
L561	1-410-369-11	INDUCTOR CHIP 1UH	
L610	1-410-381-11	INDUCTOR CHIP 10UH	
L611	1-410-381-11	INDUCTOR CHIP 10UH	
L612	1-410-655-31	INDUCTOR CHIP 120UH	
		TRANSISTOR	
Q101	8-729-402-84	TRANSISTOR XN4601	
Q102	8-729-402-84	TRANSISTOR XN4601	
Q103	8-729-402-84	TRANSISTOR XN4601	
Q104	8-729-402-84	TRANSISTOR XN4601	
Q105	8-729-402-84	TRANSISTOR XN4601	
Q106	8-729-905-23	TRANSISTOR 2SA1576-R	
Q107	8-729-402-84	TRANSISTOR XN4601	
Q131	8-729-421-23	TRANSISTOR XN1216	
Q132	8-729-117-32	TRANSISTOR 2SC4177	
Q133	8-729-117-32	TRANSISTOR 2SC4177	
Q134	8-729-905-23	TRANSISTOR 2SA1576-R	
Q142	8-729-117-32	TRANSISTOR 2SC4177	
Q181	8-729-117-32	TRANSISTOR 2SC4177	
Q182	8-729-402-78	TRANSISTOR XN6401	
Q183	8-729-905-23	TRANSISTOR 2SA1576-R	
Q184	8-729-117-32	TRANSISTOR 2SC4177	
Q185	8-729-421-23	TRANSISTOR XN1216	
Q186	8-729-905-23	TRANSISTOR 2SA1576-R	
Q187	8-729-905-23	TRANSISTOR 2SA1576-R	
Q188	8-729-117-32	TRANSISTOR 2SC4177	
Q189	8-729-905-23	TRANSISTOR 2SA1576-R	
Q190	8-729-117-32	TRANSISTOR 2SC4177	
Q191	8-729-402-78	TRANSISTOR XN6401	
Q192	8-729-402-78	TRANSISTOR XN6401	
Q193	8-729-402-78	TRANSISTOR XN6401	
Q194	8-729-905-23	TRANSISTOR 2SA1576-R	
Q195	8-729-905-23	TRANSISTOR 2SA1576-R	
Q196	8-729-117-32	TRANSISTOR 2SC4177	
Q254	8-729-402-84	TRANSISTOR XN4601	
Q255	8-729-117-32	TRANSISTOR 2SC4177	
Q256	8-729-402-84	TRANSISTOR XN4601	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
Q257	8-729-117-32	TRANSISTOR 2SC4177	
Q302	8-729-905-23	TRANSISTOR 2SA1576-R	
Q303	8-729-905-23	TRANSISTOR 2SA1576-R	
Q304	8-729-117-32	TRANSISTOR 2SC4177	
Q305	8-729-117-32	TRANSISTOR 2SC4177	
Q306	8-729-402-84	TRANSISTOR XN4601	
Q307	8-729-117-32	TRANSISTOR 2SC4177	
Q308	8-729-117-32	TRANSISTOR 2SC4177	
Q309	8-729-905-23	TRANSISTOR 2SA1576-R	
Q361	8-729-403-07	TRANSISTOR XN1213	
Q362	8-729-403-10	TRANSISTOR XN6215	
Q363	8-729-117-32	TRANSISTOR 2SC4177	
Q364	8-729-403-10	TRANSISTOR XN6215	
Q365	8-729-402-78	TRANSISTOR XN6401	
Q367	8-729-117-32	TRANSISTOR 2SC4177	
Q368	8-729-403-10	TRANSISTOR XN6215	
Q369	8-729-109-42	TRANSISTOR 2SK94-X2	
Q501	8-729-117-32	TRANSISTOR 2SC4177	
Q502	8-729-117-32	TRANSISTOR 2SC4177	
Q503	8-729-905-23	TRANSISTOR 2SA1576-R	
Q504	8-729-117-32	TRANSISTOR 2SC4177	
Q505	8-729-102-08	TRANSISTOR 2SC2223-F14	
Q508	8-729-117-32	TRANSISTOR 2SC4177	
Q509	8-729-905-23	TRANSISTOR 2SA1576-R	
Q561	8-729-905-23	TRANSISTOR 2SA1576-R	
Q562	8-729-403-24	TRANSISTOR XN4210	
Q563	8-729-905-18	TRANSISTOR DTC144EU	
Q564	8-729-921-08	TRANSISTOR DTC144TU	
Q565	8-729-402-78	TRANSISTOR XN6401	
Q566	8-729-402-19	TRANSISTOR XN6501	
Q567	8-729-402-78	TRANSISTOR XN6401	
Q568	8-729-109-42	TRANSISTOR 2SK94-X2	
Q569	8-729-905-23	TRANSISTOR 2SA1576-R	
Q570	8-729-905-15	TRANSISTOR DTC144WU	
Q571	8-729-920-39	TRANSISTOR IMT1US	
Q572	8-729-805-27	TRANSISTOR 2SB1121-U	
Q573	8-729-905-18	TRANSISTOR DTC144EU	
Q610	8-729-403-10	TRANSISTOR XN6215	
Q611	8-729-402-84	TRANSISTOR XN4601	
Q612	8-729-921-08	TRANSISTOR DTC144TU	
Q613	8-729-117-32	TRANSISTOR 2SC4177	
Q614	8-729-117-32	TRANSISTOR 2SC4177	
Q619	8-729-117-32	TRANSISTOR 2SC4177	
Q620	8-729-117-32	TRANSISTOR 2SC4177	
Q621	8-729-402-19	TRANSISTOR XN6501	

RESISTOR

Ref.No	Part No.	Description				Remark
R101	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R102	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R103	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R105	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R107	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R108	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R109	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R111	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R112	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R113	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R114	1-216-068-00	METAL GLAZE	6.2K	5%	1/10W	
R115	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R116	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R117	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R118	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R119	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R120	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R121	1-216-842-11	METAL GLAZE	56K	5%	1/16W	
R122	1-216-843-11	METAL GLAZE	68K	5%	1/16W	
R123	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R124	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R125	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R126	1-216-809-11	METAL GLAZE	100	5%	1/16W	
R127	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R128	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R129	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R130	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R131	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R132	1-216-844-11	METAL GLAZE	82K	5%	1/16W	
R133	1-216-844-11	METAL GLAZE	82K	5%	1/16W	
R134	1-216-850-11	METAL GLAZE	270K	5%	1/16W	
R135	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R136	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R137	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R138	1-216-844-11	METAL GLAZE	82K	5%	1/16W	
R139	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R140	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R141	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R142	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R143	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R144	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R145	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R146	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R157	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R158	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R159	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R161	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R163	1-216-811-11	METAL GLAZE	150	5%	1/16W	
R165	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R166	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R181	1-216-072-00	METAL GLAZE	9.1K	5%	1/10W	
R182	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R183	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R184	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R185	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R186	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R187	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R188	1-216-812-11	METAL GLAZE	180	5%	1/16W	
R189	1-216-820-11	METAL GLAZE	820	5%	1/16W	

When indicating parts by reference number, please include the board name.

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Ref.No	Part No.	Description				Remark
R190	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R192	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R193	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R194	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R195	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R196	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R197	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R198	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R199	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R200	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R201	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R202	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R203	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R204	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R205	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R206	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R207	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R208	1-216-842-11	METAL GLAZE	56K	5%	1/16W	
R209	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R210	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R211	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R212	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R213	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R214	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R215	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R218	1-216-994-11	METAL GLAZE	13K	5%	1/16W	
R219	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R220	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R221	1-216-834-11	METAL GLAZE	12K	5%	1/16W	
R222	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R223	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R224	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R225	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R226	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R227	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R229	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R230	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R231	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R233	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R252	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R259	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R265	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R266	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R268	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R269	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R270	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R271	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R272	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R273	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R274	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R275	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R276	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R277	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R278	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R279	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R280	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R281	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R282	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R283	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R284	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R285	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R301	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R302	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R303	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R306	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R308	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R310	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R311	1-216-844-11	METAL GLAZE	82K	5%	1/16W	
R312	1-216-844-11	METAL GLAZE	82K	5%	1/16W	
R313	1-216-846-11	METAL GLAZE	120K	5%	1/16W	
R314	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R315	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R316	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R317	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R318	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R319	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R320	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R322	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R323	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R324	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R325	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R326	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R327	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R328	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R329	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R330	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R331	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R332	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R333	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R334	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R335	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R336	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R337	1-216-072-00	METAL GLAZE	9.1K	5%	1/10W	
R338	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R339	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R341	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R342	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R343	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R344	1-216-842-11	METAL GLAZE	56K	5%	1/16W	
R345	1-216-842-11	METAL GLAZE	56K	5%	1/16W	
R346	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R347	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R348	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R349	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R350	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R352	1-216-838-11	METAL GLAZE	27K	5%	1/16W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R361	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R363	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R364	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R365	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R366	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R367	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R368	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R369	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R370	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R371	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R372	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R373	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R374	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R375	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R376	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R377	1-216-847-11	METAL GLAZE	150K	5%	1/16W	
R378	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R379	1-216-851-11	METAL GLAZE	330K	5%	1/16W	
R380	1-216-851-11	METAL GLAZE	330K	5%	1/16W	
R381	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R382	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R383	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R384	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R385	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R401	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R402	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R403	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R404	1-216-843-11	METAL GLAZE	68K	5%	1/16W	
R405	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R406	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R407	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R408	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R409	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R410	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R411	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R412	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R413	1-216-813-11	METAL GLAZE	220	5%	1/16W	
R415	1-216-813-11	METAL GLAZE	220	5%	1/16W	
R416	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R417	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R419	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R420	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R422	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R423	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R424	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R425	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R426	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R427	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R428	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R429	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R430	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R431	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R433	1-216-813-11	METAL GLAZE	220	5%	1/16W	

Ref.No	Part No.	Description				Remark
R434	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R435	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R436	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R437	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R438	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R439	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R441	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R442	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R443	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R503	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R505	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R506	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R507	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R508	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R509	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R510	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R511	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R512	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R513	1-216-842-11	METAL GLAZE	56K	5%	1/16W	
R514	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R515	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R516	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W	
R517	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R518	1-216-677-11	METAL CHIP	12K	0.50%	1/10W	
R519	1-216-671-11	METAL CHIP	6.8K	0.50%	1/10W	
R520	1-216-679-11	METAL CHIP	15K	0.50%	1/10W	
R521	1-216-679-11	METAL CHIP	15K	0.50%	1/10W	
R522	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R523	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R524	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R525	1-216-853-11	METAL GLAZE	470K	5%	1/16W	
R526	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R527	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R528	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R529	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R530	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R531	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R532	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R533	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R534	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R535	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R541	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R542	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R543	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R547	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R548	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R549	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R550	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R551	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R552	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W	
R561	1-216-849-11	METAL GLAZE	220K	5%	1/16W	
R562	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R563	1-216-845-11	METAL GLAZE	100K	5%	1/16W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R564	1-216-851-11	METAL GLAZE	330K	5%	1/16W	
R565	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R566	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R567	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R568	1-216-097-00	METAL GLAZE	100K	1%	1/10W	
R569	1-216-852-11	METAL GLAZE	390K	5%	1/16W	
R570	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R571	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R572	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R573	1-216-851-11	METAL GLAZE	330K	5%	1/16W	
R574 ⚠	1-216-809-11	METAL GLAZE	100	5%	1/16W	
R575	1-216-861-11	METAL GLAZE	2.2M	5%	1/16W	
R576	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R577	1-216-843-11	METAL GLAZE	68K	5%	1/16W	
R578	1-216-136-00	METAL GLAZE	2.7	5%	1/8W	
R579	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R580	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R581	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R582	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R583	1-218-172-11	METAL GLAZE	680K	1%	1/10W	
R584	1-218-172-11	METAL GLAZE	680K	1%	1/10W	
R585	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R587	1-216-807-11	METAL GLAZE	68	5%	1/16W	
R612	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R613	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R614	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R615	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R616	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R618	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R619	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R620	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R621	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R622	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R623	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R624	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R625	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R626	1-216-842-11	METAL GLAZE	56K	5%	1/16W	
R627	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R628	1-216-849-11	METAL GLAZE	220K	5%	1/16W	
R629	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R630	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R631	1-216-844-11	METAL GLAZE	82K	5%	1/16W	
R632	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R633	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R634	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R635	1-216-853-11	METAL GLAZE	470K	5%	1/16W	
R636	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R638	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R639	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R640	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R641	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R642	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R643	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R644	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R645	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R647	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R648	1-216-809-11	METAL GLAZE	100	5%	1/16W	
R649	1-216-685-11	METAL CHIP	27K	0.50%	1/10W	
R650	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R651	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R653	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R654	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R656	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R657	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R659	1-216-844-11	METAL GLAZE	82K	5%	1/16W	
R661	1-216-813-11	METAL GLAZE	220	5%	1/16W	
R662	1-216-813-11	METAL GLAZE	220	5%	1/16W	
R663	1-216-813-11	METAL GLAZE	220	5%	1/16W	
R664	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R665	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	

NETWORK RESISTOR

Ref.No	Part No.	Description	Remark
RB101	1-236-436-11	NETWORK, RES 100K	
RB181	1-236-414-11	NETWORK, RES 1.5K	
RB182	1-236-412-11	NETWORK, RES 1.0K	
RB183	1-236-423-11	NETWORK, RES 8.2K	
RB184	1-236-423-11	NETWORK, RES 8.2K	
RB251	1-236-428-11	NETWORK, RES 22K	
RB252	1-236-412-11	NETWORK, RES 1.0K	
RB253	1-236-412-11	NETWORK, RES 1.0K	
RB301	1-236-412-11	NETWORK, RES 1.0K	
RB362	1-236-436-11	NETWORK, RES 100K	
RB363	1-236-424-11	NETWORK, RES 10K	
RB561	1-236-436-11	NETWORK, RES 100K	
RB562	1-236-436-11	NETWORK, RES 100K	
RB563	1-236-412-11	NETWORK, RES 1.0K	
RB564	1-236-436-11	NETWORK, RES 100K	
RB565	1-236-436-11	NETWORK, RES 100K	
RB566	1-236-436-11	NETWORK, RES 100K	
RB567	1-236-412-11	NETWORK, RES 1.0K	
RB568	1-236-412-11	NETWORK, RES 1.0K	
RB569	1-236-412-11	NETWORK, RES 1.0K	
RB570	1-236-432-11	NETWORK, RES 47K	
RB571	1-236-412-11	NETWORK, RES 1.0K	
RB572	1-236-412-11	NETWORK, RES 1.0K	
RB574	1-236-436-11	NETWORK, RES 100K	
RB575	1-236-436-11	NETWORK, RES 100K	
RB576	1-236-424-11	NETWORK, RES 10K	
RB577	1-236-424-11	NETWORK, RES 10K	
RB611	1-236-424-11	NETWORK, RES 10K	
RB612	1-236-436-11	NETWORK, RES 100K	

VARIABLE RESISTOR

Ref.No	Part No.	Description	Remark
RV501	1-238-089-11	RES, ADJ CERMET 4.7K	
RV502	1-238-089-11	RES, ADJ CERMET 4.7K	
RV503	1-238-088-11	RES, ADJ, CERMET 2.2K	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
RV504	1-238-087-11	RES, ADJ CERMET 1K				
RV505	1-238-087-11	RES, ADJ CERMET 1K				
RV561	1-238-093-11	RES, ADJ CERMET 100K				

CRYSTAL

Ref.No	Part No.	Description	Remark
X101	1-567-898-11	OSCILLATOR, CRYSTAL	
X101	1-577-384-11	OSCILLATOR, CRYSTAL	
X361	1-577-118-11	VIBRATOR, LITHIUM NIOBATE	
X561	1-527-997-21	VIBRATOR, CRYSTAL (32.768KHz)	

****

*A-7061-784-A VF-19 BOARD, COMPLETE (Ref.No 8,000 Series)
****

CAPACITOR

Ref.No	Part No.	Description				Remark
C951	1-124-442-00	ELECT	330MF	20%	6.3V	
C953	1-163-077-00	CERAMIC CHIP	0.1MF		50V	
C954	1-135-091-00	TANTAL. CHIP	1MF	20%	16V	
C955	1-163-037-11	CERAMIC CHIP	0.022MF	10%	25V	
C956	1-131-381-00	TANTALUM	47MF	10%	6.3V	
C957	1-163-081-00	CERAMIC CHIP	0.22MF		25V	
C958	1-136-718-11	TANTAL. CHIP	0.1MF	5%	25V	
C959	1-163-109-00	CERAMIC CHIP	47PF	5%	50V	
C960	1-124-587-11	ELECT	220MF	20%	6.3V	
C961 ⚠	1-163-047-11	CERAMIC CHIP	0.001MF	10%	50V	
C962 ⚠	1-162-625-11	CERAMIC CHIP	0.0047MF	5%	50V	
C963 ⚠	1-162-625-11	CERAMIC CHIP	0.0047MF	5%	50V	
C964 ⚠	1-163-209-00	CERAMIC CHIP	0.0015MF	5%	50V	
C965	1-126-090-11	ELECT	82MF	20%	10V	
C966	1-124-257-00	ELECT	2.2MF	20%	35V	
C968	1-163-037-11	CERAMIC CHIP	0.022MF	10%	25V	
C969	1-102-038-00	CERAMIC	0.001MF		500V	

CONNECTOR

Ref.No	Part No.	Description	Remark
CN952	*1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
CN953	*1-566-195-21	PIN, CONNECTOR (PC BOARD) 2P	

DIODE

Ref.No	Part No.	Description	Remark
D951	8-719-820-65	DIODE TLS221	
D953	8-719-400-20	DIODE MA152WA	

IC

Ref.No	Part No.	Description	Remark
IC951	8-759-420-01	IC AN2512S	

COIL

Ref.No	Part No.	Description	Remark
L951	1-410-831-21	INDUCTOR 82UH	
L952	1-408-785-21	INDUCTOR CHIP 47UH	
L953 ⚠	1-459-858-11	COIL, FERRITE (HLC)	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q952 ⚠	8-729-100-67	TRANSISTOR 2SC1623-L7	
Q953	8-729-216-31	TRANSISTOR 2SA1163G	
Q954	8-729-100-67	TRANSISTOR 2SC1623-L7	
Q955	8-729-142-19	TRANSISTOR 2SD1615-T1GLGK	
Q955	8-729-400-60	TRANSISTOR 2SD874A-Q	

RESISTOR

Ref.No	Part No.	Description				Remark
R952 ⚠	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R953	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R954 ⚠	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R955	1-216-005-00	METAL GLAZE	15	5%	1/10W	
R956	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R957	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R958	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R959	1-216-113-00	METAL GLAZE	470K	5%	1/10W	
R960	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R961	1-216-160-00	METAL GLAZE	27	5%	1/8W	
R962	1-216-336-11	METAL GLAZE	47K	1%	1/10W	
R963	1-216-099-00	METAL GLAZE	120K	5%	1/10W	
R964	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R965	1-216-308-00	METAL GLAZE	4.7	5%	1/10W	
R967	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R968	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R969	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R970	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R971	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R972	1-216-101-00	METAL GLAZE	150K	5%	1/10W	
R973	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R974	1-216-131-11	METAL GLAZE	2.7M	5%	1/10W	
R975	1-216-131-11	METAL GLAZE	2.7M	5%	1/10W	
R976	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R978	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R983	1-216-121-00	METAL GLAZE	1M	5%	1/10W	

VARIABLE RESISTOR

Ref.No	Part No.	Description	Remark
RV951	1-238-092-11	RES, ADJ CERMET 47K	
RV952	1-238-086-11	RES, ADJ CERMET 470	
RV953	1-238-088-11	RES, ADJ, CERMET 2.2K	
RV954	1-238-561-11	RES, ADJ, METAL GLAZE 1M	

TRANSFORMER

Ref.No	Part No.	Description	Remark
T951 ⚠	1-439-431-21	TRANSFORMER ASSY, FLYBACK	

THERMISTOR

Ref.No	Part No.	Description	Remark
TH951	1-807-938-11	THERMISTOR	

CONNECTOR

Ref.No	Part No.	Description	Remark
W952 ⚠	1-540-019-21	SOCKET ASSY, CRT	

****

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
	1-630-588-11	TL-26 BOARD (Ref.No 9,000 Series) ************				
		DIODE				
D952	8-719-941-34	DIODE GL1HD51				
**						
	A-7070-875-A	CD-14 BOARD, COMPLETE (Ref.No 1,000 Series) *********************				
		CAPACITOR				
C901	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	
C902	1-162-638-11	CERAMIC CHIP	1MF		16V	
C903	1-135-089-21	TANTAL. CHIP	6.8MF	20%	20V	
C904	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V	
C905	1-135-147-21	TANTAL. CHIP	1MF	20%	20V	
C906	1-162-995-11	CERAMIC CHIP	0.022MF		50V	
C907	1-135-162-21	TANTAL. CHIP	33MF	20%	6.3V	
C908	1-162-995-11	CERAMIC CHIP	0.022MF		50V	
C909	1-135-155-21	TANTAL. CHIP	4.7MF	20%	16V	
C910	1-162-995-11	CERAMIC CHIP	0.022MF		50V	
C911	1-162-637-11	CERAMIC CHIP	0.47MF		16V	
		CONNECTOR				
CN301	1-568-365-41	CONNECTOR, BOARD TO BOARD 14P				
		TRANSISTOR				
Q901	8-765-105-53	TRANSISTOR 2SK300-3				
		RESISTOR				
R901	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R902	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R903	1-216-848-11	METAL GLAZE	180K	5%	1/16W	
R904	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R905	1-216-809-11	METAL GLAZE	100	5%	1/16W	
R906	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R907	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
**						
	A-7070-876-A	EL-1 BOARD, COMPLETE (Ref.No 5.000 Series) *********************				
		CAPACITOR				
C942	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V	
C943	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V	
C944	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V	
C945	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V	
		CONNECTOR				
CN941	1-566-757-11	PIN, CONNECTOR (PC BOARD) 2P				
CN942	*1-566-758-11	PIN, CONNECTOR (PC BOARD) 3P				

Ref.No	Part No.	Description				Remark
CN943	*1-565-541-11	PIN, CONNECTOR (PC BOARD) 2P				
		DIODE				
D941	8-719-420-15	DIODE MA8082-M				
D942	8-719-106-71	DIODE RD12M-B2				
D943	8-719-941-86	DIODE DAN202U				
D944	8-719-420-15	DIODE MA8082-M				
D945	8-719-420-15	DIODE MA8082-M				
		JACK				
J902	1-565-276-11	JACK, ULTRA SMALL 1P (REMOTE)				
J903	1-568-027-11	JACK, SMALL TYPE 1P (②)				
		COIL				
L941	1-410-369-11	INDUCTOR CHIP	1UH			
L942	1-410-369-11	INDUCTOR CHIP	1UH			
L943	1-410-369-11	INDUCTOR CHIP	1UH			
L944	1-410-369-11	INDUCTOR CHIP	1UH			
L945	1-410-369-11	INDUCTOR CHIP	1UH			
		RESISTOR				
R941	1-216-295-91	METAL GLAZE	0	5%	1/8W	
**						
	A-7070-878-A	MA-32 BOARD, COMPLETE (Ref.No 4,000 Series) *********************				
		CAPACITOR				
C401	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V	
C402	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V	
C403	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V	
C404	1-162-953-11	CERAMIC CHIP	100PF	5%	50V	
C406	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V	
C407	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V	
C408	1-164-156-11	CERAMIC CHIP	0.1MF		25V	
C409	1-124-967-11	ELECT	10MF	20%	10V	
C410	1-162-953-11	CERAMIC CHIP	100PF	5%	50V	
C411	1-135-181-21	TANTAL. CHIP	4.7MF	20%	6.3V	
C412	1-135-181-21	TANTAL. CHIP	4.7MF	20%	6.3V	
C413	1-126-205-11	ELECT CHIP	47MF	20%	6.3V	
C414	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V	
C415	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C416	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V	
C418	1-163-022-00	CERAMIC CHIP	0.012MF	10%	50V	
C419	1-163-022-00	CERAMIC CHIP	0.012MF	10%	50V	
C420	1-163-022-00	CERAMIC CHIP	0.012MF	10%	50V	
C481	1-163-022-00	CERAMIC CHIP	0.012MF	10%	50V	
		CONNECTOR				
CN404	*1-565-543-11	PIN, CONNECTOR (PC BOARD) 4P				
CN405	*1-566-758-11	PIN, CONNECTOR (PC BOARD) 3P				

When indicating parts by reference number, please include the board name.

DIODE

Ref.No	Part No.	Description	Remark
D401	8-719-420-15	DIODE MA8082-M	

JACK

Ref.No	Part No.	Description	Remark
J904	1-568-027-11	JACK, SMALL TYPE 1P (MIC PLUG IN POWER)	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q401	8-729-905-23	TRANSISTOR 2SA1576-R	
Q402	8-729-117-32	TRANSISTOR 2SC4177	
Q403	8-729-117-32	TRANSISTOR 2SC4177	
Q404	8-729-117-32	TRANSISTOR 2SC4177	
Q405	8-729-117-32	TRANSISTOR 2SC4177	
Q481	8-729-117-32	TRANSISTOR 2SC4177	

RESISTOR

Ref.No	Part No.	Description				Remark
R401	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R402	1-216-834-11	METAL GLAZE	12K	5%	1/16W	
R403	1-216-844-11	METAL GLAZE	82K	5%	1/16W	
R404	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R405	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R406	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R407	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R408	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R409	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R410	1-216-810-11	METAL GLAZE	120	5%	1/16W	
R411	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R412	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R413	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R414	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R415	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R416	1-216-815-11	METAL GLAZE	330	5%	1/16W	
R417	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R418	1-216-673-11	METAL CHIP	8.2K	0.50%	1/10W	
R419	1-216-673-11	METAL CHIP	8.2K	0.50%	1/10W	
R420	1-216-673-11	METAL CHIP	8.2K	0.50%	1/10W	
R481	1-216-673-11	METAL CHIP	8.2K	0.50%	1/10W	
R482	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R483	1-216-811-11	METAL GLAZE	150	5%	1/16W	
R484	1-216-296-00	METAL GLAZE	0	5%	1/8W	

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1-630-589-11 JK-40 FLEXIBLE BOARD (Ref.No 7,000 Series)
****

JACK

Ref.No	Part No.	Description	Remark
J901	1-537-142-11	TERMINAL BOARD (V-RFU DC OUT-A)	

SWITCH

Ref.No	Part No.	Description	Remark
S921	1-570-134-11	SWITCH, SLIDE (OUTPUT/INPUT)	

****

MISCELLANEOUS
****

Ref.No	Part No.	Description	Remark
	1-466-146-11	SWITCH BLOCK, FK-9	
	1-466-147-11	SWITCH BLOCK, CF-4	
	⚠ 1-466-148-11	CONVERTER UNIT, DC-DC	
	1-542-126-11	MICROPHONE UNIT	
	1-547-335-11	LENS, ZOOM (VCL-1106XA)	
	1-547-357-11	FILTER BLOCK, OPTICAL	
	1-568-334-11	CONNECTOR, BOARD TO BOARD 16P (CF-4 SWITCH BLOCK CN751)	
	1-568-335-11	CONNECTOR, BOARD TO BOARD 18P (FK-9 SWITCH BLOCK CN603)	
	1-627-722-11	FP-149 FLEXIBLE BOARD	
F901	⚠ 1-537-217-11	TERMINAL BOARD, BATTERY	
F902	⚠ 1-532-778-21	FUSE, MICRO (SECONDARY)	
F903	⚠ 1-808-753-11	DISPLAY BLOCK, LIQUID CRYSTAL	
IC901	A-7030-124-A	IC ICX026BK-2 ASSY (CCD IMAGER)	
M901	A-7048-202-A	DRUM BLOCK ASSY (DGH-32A-R)	
M902	8-835-329-01	MOTOR, DC U-21A (CAPSTAN)	
M903	1-541-607-11	MOTOR, DC (LA12G-344VA) (LOADING)	
M904	3-707-660-01	METER ASSY, EE (IRIS)	
M905	3-707-659-01	MOTOR ASSY, AF/Z GEAR (FOCUS/ZOOM)	
S901	3-707-662-01	SW ASSY, LEAF (FOCUS END SWITCH)	
V901	⚠ 1-452-482-31	CRT ASSY (M91JYZ60WB)	

****

ACCESSORIES AND PACKING MATERIALS
****

Part No.	Description	Remark
*3-704-281-01	BAG, PROTECTION (STANDARD)	
3-707-568-01	ADAPTOR, LENS HOOD	
3-735-474-01	PV/DECK FLYER (US MODEL)	
*3-736-301-01	CUSHION (UPPER)	
*3-736-302-01	CUSHION (LOWER)	
3-736-837-01	BAG, PROTECTION, EVF	
3-750-315-21	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH)	

**** ACCESSORIES AND PACKING MATERIALS (KIT) ****

Part No.	Description	Remark
*1-571-163-31	SWITCH, ANTENNA CHANGE (CABLE)	
*1-464-981-21	RFU ADAPTOR (RFU-89UCA)	
3-712-595-21	BELT, SHOULDER	
*3-736-870-01	SLEEVE, ACC KIT	
*3-736-871-01	INDIVDU CARTON	
*3-736-874-01	CUSHION (UPPER), ACC	
*3-736-875-01	CUSHION (INNER), ACC	
*3-736-876-01	CUSHION (LOWER), ACC	
** AC-V30	AC ADAPTOR	
*** NP-55	BATTERY PACK	

Note

** MARK PARTS IS AVAILABLE FOR REPAIR SERVICE.
*** MARK PARTS IS AVAILABLE AS AN OPTIONAL ACCESSORY.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

```
      Part No.     Description                      Remark
**************************************************************

                HARDWARE LIST
                *************

                SCREW

      7-621-281-15  SCREW +P   2X2
      7-621-772-00  SCREW +B   2X3

                STOP RING

      7-624-102-04  STOP RING 1.5, TYPE -E

                STEEL BALL

      7-671-112-01  STEEL, BALL

**************************************************************
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When indicating parts by reference number, please include the board name.

SECTION 7

CAMERA ADJUSTMENTS

During the adjustment, see the arrangement diagram for adjustment parts from page 278.

7-1. PRE-ADJUSTMENT PREPARATIONS (CAMERA BLOCK)

7-1-1. List of Servicing Jigs

- Oscilloscope
- Regulated power supply (2 units)
- Adjusting screwdriver
- Color monitor
- Vectorscope
- Digital voltmeter

Ref. No.	Part Name	Part No.	Use
J-1	Filter (C14) for color temperature correction (Combination of C2 and C12)	J-6080-058-A	Auto white balance confirmation
J-2	ND filter 1.0	J-6080-808-A	Max. gain adjustment (two filters used)
	ND filter 0.4	J-6080-806-A	Iris adjustment, iris in/out adjustment (two used)
	ND filter 0.3	J-6080-818-A	Max. gain adjustment
	ND filter 0.1	J-6080-807-A	Iris adjustment, iris in/out adjustment
J-3	Pattern box PTB-450*		
J-4	Pattern box color chart	J-6020-250-A	
J-5	Siemens star	J-6080-875-A	For flange back adjustment
J-6	AF microprocessor data reading jig	J-6082-025-A	
J-7	Adjustment remote commander	Modification of RM-95	
J-8	Extension cord (16P)	J-6082-062-A	Extension for CF-4 (operation switch) block (during operation)
	Extension cord (14P)	J-6082-061-A	Extension cord for CD-14 board (when repairing VC-60 board)
	Extension cord (20P)	J-6082-063-A	Extension cord for LD-11 board (when repairing VC-60 board)
			Extension cord for TI-15 board (when repairing TI-15 board)
J-9	Extension cord (10P)	J-6082-064-A	Extension cord for JK-40 board (when repairing VS-22 board)

* PTB-500 (J-6029-140-A) can also be used.

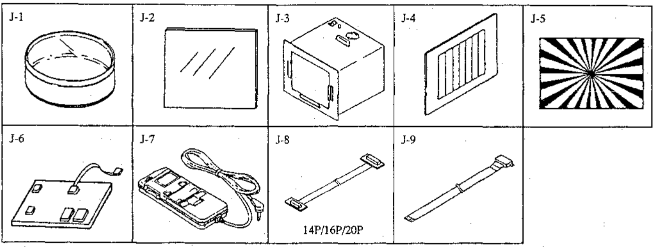


Fig. 7-1.

7-1-2. Preparations

Note: Refer to "2. DISASSEMBLY" for details on removal of the cabinet and various boards.

1) Connect the various devices for adjustment as shown in Fig. 7-3.
2) The EVF (electronic viewfinder) is needed for confirmation of the white balance mode and shutter speed. Remove CN205 on the VS-22 board when the EVF is not needed.
3) The mic amplifier (MA-32 board) is not needed. Remove CN402 on the AU-51 board.

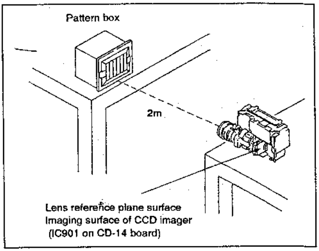
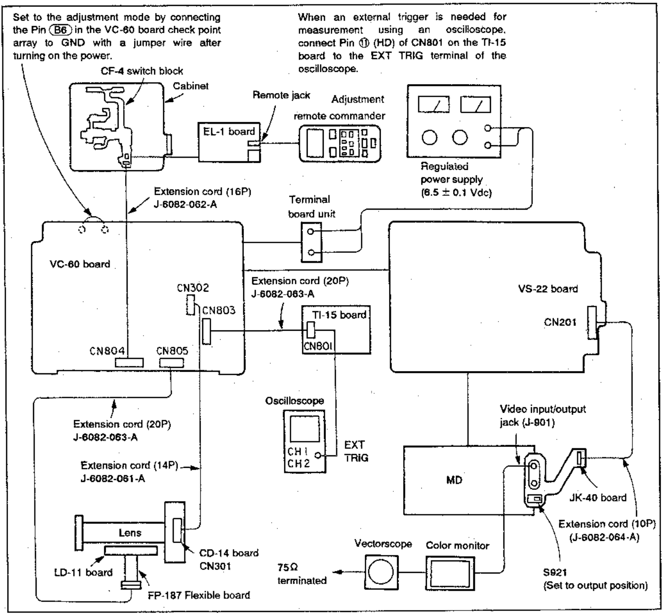

Pattern box
2m
Lens reference plane surface
Imaging surface of CCD imager
(IC901 on CD-14 board)

Fig. 7-2.


Set to the adjustment mode by connecting the Pin (B6) in the VC-60 board check point array to GND with a jumper wire after turning on the power.

When an external trigger is needed for measurement using an oscilloscope, connect Pin ⑪ (HD) of CN801 on the TI-15 board to the EXT TRIG terminal of the oscilloscope.

CF-4 switch block
Cabinet
Remote jack
Adjustment remote commander
EL-1 board
Regulated power supply (6.5 ± 0.1 Vdc)
Extension cord (16P) J-6082-062-A
Terminal board unit
VC-60 board
CN302
CN803
CN804
CN805
Extension cord (20P) J-6082-063-A
TI-15 board
CN801
VS-22 board
CN201
Oscilloscope
CH1
CH2
EXT TRIG
Extension cord (20P) J-6082-063-A
Extension cord (14P) J-6082-061-A
Video input/output jack (J-901)
MD
JK-40 board
Extension cord (10P) (J-6082-064-A)
Lens
CD-14 board CN301
LD-11 board
FP-187 Flexible board
Vectorscope
Color monitor
75Ω terminated
S921 (Set to output position)

Fig. 7-3.

7-1-3. Precautions

1) Setting of Switches
Unless specified otherwise, the switches are set to the following positions and adjustment is made without a cassette inserted.
   1. Camera/video power switch (S901 on FK-9 board) ......camera
   2. Standby switch (S909 on FK-9 board) ......standby
   3. Auto-lock switch (S751 on CF-4 board) ......OFF
   4. White balance button (S757 on CF-4 board) ...... ☼ (indoors white balance mode)
   5. Shutter speed button (S760 on CF-4 board) ......normal (1/60)
   6. Input/output select switch (S921 on JK-40 board) ......output

2) Adjustment Order
As a rule, the adjustments are performed in the listed order.

3) Subjects
   1. Color bar chart (standard picture frame)
   When performing adjustment using the color bar chart, adjust the picture frame shown in Fig. 7-4. (standard picture frame).
   2. White pattern (standard picture frame)
   Remove the color bar chart from the pattern box and use the zoom lever so that the white pattern has the same size and is in the same position as the color bar chart (standard picture frame).

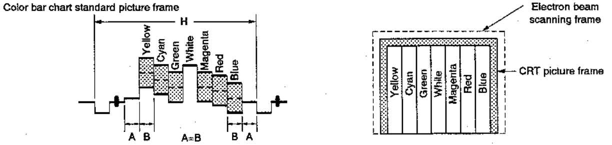

Color bar chart standard picture frame
H
Yellow
Cyan
Green
White
Magenta
Red
Blue
A B
A≒B
B A
Electron beam scanning frame
CRT picture frame
Yellow
Cyan
Green
White
Magenta
Red
Blue

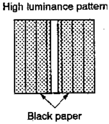
Fig. a (Video input/output terminal output waveform)

Fig. b (Picture on monitor TV)

Adjust the zooming and direction of the camera to obtain the output waveform shown in Fig. a and the monitor TV picture shown in Fig. b.

Fig. 7-4.

   3. All white pattern
   Remove the color bar chart from the pattern box and set the zoom lever fully to the TELE (66 mm) side.
   4. High luminance pattern
   Create the high luminance pattern as shown in Fig. 7-5., and adjust for the picture frame shown in Fig. 7-6.
   5. Siemens star (J-6080-875-A)
   Adjust the direction of the camera so that center of the Siemens star is lined up with the center of the monitor screen on the monitor TV screen.


High luminance pattern
Black paper

Attach black paper over all sections of the pattern except for half of the white bar of the color bar chartt. Display the picture on the monitor with the standard picture frame.

Fig. 7-5.

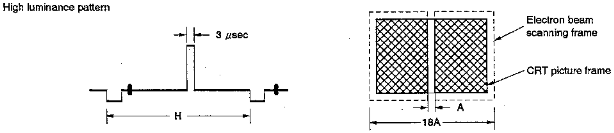

High luminance pattern
3 μsec
H
Electron beam scanning frame
CRT picture frame
A
18A

Fig. a (Video input/output terminal output waveform)

Fig. b (Picture on monitor TV)

Adjust the zooming and direction of the camera to obtain the output waveform shown in Fig. a and the monitor TV picture shown in Fig. b.

Fig. 7-6.

7-1-4. Adjustment Remote Commander

An EVR (electronic variable resistor) is used as the adjustment element for the camera block, replacing the conventional semi-fixed resistor. The EVR is controlled by the EVR/AWB microprocessor (IC361 on VC-60 board). This microprocessor reads the data written in the nonvolatile memory of the microprocessor and sends it to the EVR. The EVR D-A converts this data (8 bits for each adjustment point) and creates the adjustment voltage.

Thus, it is necessary to change the adjustment data contained in the nonvolatile memory when adjusting the camera block, and the adjustment memory is used for this purpose.

The adjustment remote commander performs bidirectional communications with the camera block microprocessor using the remote control signal lines (LANC). Adjustment addresses and adjustment data increment/decrement commands are sent to the camera block microprocessor from the adjustment remote commander. Adjustment addresses and adjustment data are sent from the camera block microprocessor to the adjustment remote commander.

1. Use of adjustment remote commander

Solder the lead wire to Pin (B6) (refer to 7-1-5) of the check point array on the VC-60 board.

1) Connect the adjustment remote commander to the remote terminal (J902 on EL-1 board). (Set the HOLD switch of the adjustment remote commander to the HOLD position (SERVICE position).)
2) Turn on the power of the main unit.
3) Connect Pin (B6) ($\overline{\text{CAM ADJ}}$) of the check point array to GND using a jumper wire.
   (This connection causes the EVR/AWB microprocessor to cease normal remote control operation and to begin adjustment dedicated communications.)
   Note: Be sure to make this connection only after turning on the power. The following will be displayed on the LCD of the adjustment remote commander if the connection is normal. (Adjustment data varies according to the unit.)

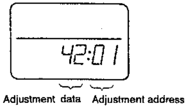


Fig. 7-7.

4) Designate the desired adjustment address using the adjustment remote commander. The adjustment address is incremented by pressing the FF (▸▸) button and decremented by pressing the REW (◂◂) button. (The adjustment address is indicated in decimal, and there are 89 addresses from .01 to 89. The adjustment address corresponds to the EVR (IC252, IC302, IC611 on VC-60 board) output terminals. Refer to Table 7-3. for the adjustment contents of the various addresses.)

5) Perform adjustment by incrementing or decrementing the adjustment data.
The adjustment data is incremented by pressing the PLAY (►) button. The adjustment data is decremented by pressing the STOP (■) button.
   - The adjustment address is indicated in hexadecimal. There are 256 values from 00 to FF.

Hexadecimal	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Indication on LCD	0	1	2	3	4	5	6	7	8	9	A	b	c	d	E	F
Decimal equivalent	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Table 7-1.

- The adjustment data corresponds to the EVR (IC252, IC302, IC611 on VC-60 board) output voltage, and is as follows.

Adjustment data ( ) is decimal equivalent	EVR output voltage
FF (=255)	Maximum value (approx. 5 Vdc)
F0 (=240)	↑
E0 (=224)	
D0 (=208)	
C0 (=192)	
B0 (=176)	
A0 (=160)	
90 (=144)	
80 (=128)	Center value (approx. 2.5 Vdc)
70 (=112)	
60 (=96)	
50 (=80)	
40 (=64)	
30 (=48)	
20 (=32)	
10 (=16)	↓
00 (=0)	Minimum value (approx. 0 Vdc)

Table 7-2.

6) The adjustment address is changed using the FF (►►) button or REW (◄◄) button to store the adjustment data in the nonvolatile memory of EVR/AWB microprocessor (IC361 on VC-60 board).
(The new adjustment data is not stored in the nonvolatile memory unless this operation is performed.)

2. Precautions on use of adjustment remote commander

It is possible to accidentally erase correct adjustment data due to an error in operation of the adjustment remote commander. In order to prevent this, we recommend that you make a note of all adjustment data before adjustment and record the new adjustment data after completing each adjustment item.

3. Adjustment address table

Adjustment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Adjustment Data Memo Column
01	Pin ⑱ of IC252	DELTA R	Auto white balance adjustment	
02	Pin ⑲ of IC252	DELTA B		
03	Pin ② of IC252	TITLE PEDESTAL		
04	Pin ③ of IC252	C-PED	Fixed at "A0"	A0
05	Pin ④ of IC252	R-Y GAIN	Color reproduction (gain) adjustment	
06	Pin ⑤ of IC252	B-Y GAIN		
07	Pin ⑥ of IC252	R-Y HUE	Color reproduction (hue) adjustment	
08	Pin ⑦ of IC252	B-Y HUE		
09	Pin ⑧ of IC252	C LEVEL		
10	Pin ⑨ of IC252	TITLE Y		
11	Pin ⑫ of IC252	R GAIN	Pre-white balance adjustment	
12	Pin ⑬ of IC252	B GAIN		
13	Pin ⑱ of IC302	C1 GAIN	Chroma matrix adjustment	
14	Pin ⑲ of IC302	Y1 GAIN	Y matrix adjustment	
15	Pin ② of IC302	TITLE A/D		
16	Pin ③ of IC302	BURST LEVEL		
17	Pin ④ of IC302	HUE CONT	Not used	
18	Pin ⑤ of IC302	SYNC LEVEL		
19	Pin ⑥ of IC302	SET UP		
20	Pin ⑦ of IC302	WHITE CLIP	White clip adjustment	
21	Pin ⑧ of IC302	Y LEVEL		
22	Pin ⑨ of IC302	APERTURE	Aperture adjustment	
23	Pin ⑫ of IC302	YH GAIN	YH level adjustment	
24	Pin ⑬ of IC302	C2 GAIN	Chroma matrix adjustment	
25	Pin ⑱ of IC611	IRIS		
26	Pin ⑲ of IC611	FOCUS SPEED		
27	Pin ② of IC611	HALL OFFSET		
28	Pin ③ of IC611	MAX GAIN		
29	Pin ④ of IC611	AGC		
30	Pin ⑤ of IC611	V SUB		—
31		———		
32		———		
33		———		—
34		———		—
35		———		—
36		———		—

Table 7-3. (1)

<table>
<tr><th>Adjustment Address</th><th>Adjustment Voltage Output Terminal</th><th>Adjustment Item</th><th>Remarks</th><th>Adjustment Data Memo Column</th></tr>
<tr><td>37</td><td></td><td>MODE</td><td>The following adjustment modes are selected by changing the adjustment data.
<table>
<tr><th>Adjustment data</th><th>Adjustment mode</th></tr>
<tr><td>00</td><td>Release</td></tr>
<tr><td>01</td><td>Focus hunching</td></tr>
<tr><td>03</td><td>Zoom position</td></tr>
<tr><td>05</td><td>Hall, iris close</td></tr>
<tr><td>07</td><td>Hall, iris open</td></tr>
<tr><td>09</td><td>Hall in/out threshold</td></tr>
<tr><td>0B</td><td>Auto-focus LLA</td></tr>
<tr><td>FD</td><td>Auto-focus filter fixed at FA</td></tr>
<tr><td>FF</td><td>Auto-focus filter fixed at FH</td></tr>
</table></td><td>00</td></tr>
<tr><td>38</td><td></td><td>LLA</td><td>Auto-focus LLA adjustment</td><td></td></tr>
<tr><td>39</td><td></td><td>MACRO</td><td></td><td></td></tr>
<tr><td>40</td><td></td><td>IN/OUT DOOR</td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>41</td><td></td><td>LOW CONT</td><td>Fixed at 03</td><td>03</td></tr>
<tr><td>42</td><td></td><td>BASE H</td><td>Auto-focus adjustment</td><td></td></tr>
<tr><td>43</td><td></td><td>THR UP</td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>44</td><td></td><td>STEP</td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>45</td><td></td><td>Hysteresis</td><td></td><td></td></tr>
<tr><td>46</td><td></td><td>HALL LEVEL</td><td></td><td></td></tr>
<tr><td>47</td><td></td><td>HANT LIMIT</td><td>Fixed at 02</td><td>02</td></tr>
<tr><td>48</td><td></td><td>FA BASE</td><td>Fixed at 28</td><td>28</td></tr>
<tr><td>49</td><td></td><td>INCLINE</td><td>Fixed at 06</td><td>06</td></tr>
<tr><td>50</td><td></td><td>TOPCHECK-THR</td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>51</td><td></td><td>BACK RUSH</td><td>Fixed at 02</td><td>02</td></tr>
<tr><td>52</td><td></td><td>TOP CHECK SEARCH</td><td>Fixed at 02</td><td>02</td></tr>
<tr><td>53</td><td></td><td>TOP LIMIT</td><td>Fixed at 05</td><td>05</td></tr>
<tr><td>54</td><td></td><td>FOCUS SPEED</td><td>Fixed at 01</td><td>01</td></tr>
<tr><td>55</td><td></td><td>TOP CHECK COUNTER</td><td>Fixed at 02</td><td>02</td></tr>
<tr><td>56</td><td></td><td>MODE1 THR</td><td>Fixed at 04</td><td>04</td></tr>
<tr><td>57, 58</td><td></td><td>———</td><td>Not used</td><td>—</td></tr>
<tr><td>59</td><td></td><td>START R</td><td>Preset R CONT data for reset start</td><td>30</td></tr>
<tr><td>60</td><td></td><td>START B</td><td>Preset B CONT data for reset start</td><td>41</td></tr>
<tr><td>61</td><td></td><td>BTM SLP R</td><td>Fixed at 22</td><td>22</td></tr>
<tr><td>62</td><td></td><td>BTM SLP B</td><td>Fixed at 10</td><td>10</td></tr>
<tr><td>63</td><td></td><td>MDL SLP R</td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>64</td><td></td><td>MDL SLP B</td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>65</td><td></td><td>TOP SLP R</td><td rowspan="2">Auto white balance adjustment</td><td></td></tr>
<tr><td>66</td><td></td><td>TOP SLP B</td><td></td></tr>
<tr><td>67</td><td></td><td>KEIKO R</td><td>Fixed at 10</td><td>10</td></tr>
<tr><td>68</td><td></td><td>KEIKO B</td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>69</td><td></td><td>BTM UP</td><td>Fixed at 89</td><td>89</td></tr>
<tr><td>70</td><td></td><td>BTM DWN</td><td>Fixed at 61</td><td>61</td></tr>
</table>

Table 7-3. (2)

<table>
<tr><th>Adjustment Address</th><th>Adjustment Voltage Output Terminal</th><th>Adjustment Item</th><th>Remarks</th><th>Adjustment Data Memo Column</th></tr>
<tr><td>71</td><td></td><td>MDL UP</td><td>Fixed at 7C</td><td>7C</td></tr>
<tr><td>72</td><td></td><td>MDL DWN</td><td>Fixed at 6A</td><td>6A</td></tr>
<tr><td>73</td><td></td><td>TOP UP</td><td rowspan="2">Auto white balance adjustment</td><td></td></tr>
<tr><td>74</td><td></td><td>TOP DWN</td><td></td></tr>
<tr><td>75</td><td></td><td>KEIKO DWN</td><td>Fixed at 8C</td><td>8C</td></tr>
<tr><td>76</td><td></td><td>R DWN LMT</td><td>Fixed at 1E</td><td>1E</td></tr>
<tr><td>77</td><td></td><td>B UP LMT</td><td rowspan="5">Auto white balance adjustment</td><td></td></tr>
<tr><td>78</td><td></td><td>R OUT LMT</td><td></td></tr>
<tr><td>79</td><td></td><td>B OUT LMT</td><td></td></tr>
<tr><td>80</td><td></td><td>R OUTDOOR</td><td></td></tr>
<tr><td>81</td><td></td><td>B OUTDOOR</td><td></td></tr>
<tr><td>82</td><td></td><td>BM DIV</td><td>Fixed at 23</td><td>23</td></tr>
<tr><td>83</td><td></td><td>DELAY TM</td><td>Auto white balance tracking speed. Fixed at 15</td><td>15</td></tr>
<tr><td>84</td><td></td><td>FAST TM</td><td>Fixed at 20</td><td>20</td></tr>
<tr><td>85</td><td></td><td>CAM DDS 0</td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>86</td><td></td><td></td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>87</td><td></td><td></td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>88</td><td></td><td>CAM ALN</td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>89</td><td></td><td>AWB mode</td><td>The following auto white balance adjustment modes are selected by changing the adjustment data.
<table>
<tr><th>Adjustment data</th><th>Adjustment mode</th></tr>
<tr><td>00</td><td>Release</td></tr>
<tr><td>10</td><td>White balance value output (within tracking zone)</td></tr>
<tr><td>E0</td><td>Auto white balance adjustment possible</td></tr>
<tr><td>F0</td><td>Auto white balance tracking zone evaluation invalid</td></tr>
</table></td><td>00</td></tr>
</table>

Table 7-3. (3)

7-1-5. Check Point Array

Almost all of the measurement points for camera block adjustment are located in the check point array on the VC-60 board. Solder short lead wires onto the terminals needed for adjustment and connect an oscilloscope, etc.

The terminal numbers and signal names for the check point array are shown in Table 7-4.

Terminal No.	Signal Name	Terminal No.	Signal Name
A1	G OUT	B1	N.C
A2	N.C	B2	N.C
A3	N.C	B3	Y(LPF)OUT
A4	Y0	B4	V SUB
A5	Y1	B5	AW ADJ
A6	C0	B6	$\overline{\text{CAM ADJ}}$
A7	C1	B7	MODE
A8	CAM Y	B8	N.C
A9	YH	B9	SHUTTER EN
A10	CAM C	B10	GND
A11	N.C	B11	CCD OUT

Table 7-4.

* N.C......no connection

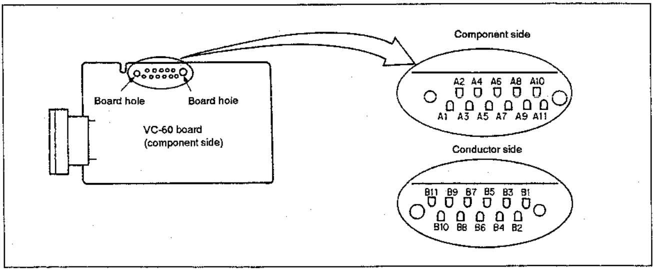

Component side
A2 A4 A6 A8 A10
A1 A3 A5 A7 A9 A11
Board hole
Board hole
VC-60 board
(component side)
Conductor side
B11 B9 B7 B5 B3 B1
B10 B8 B6 B4 B2

Fig. 7-8.

7-1-6. AF Microprocessor Data Reading Jig

The AF microprocessor data reading jig converts the serial data (output data varies according to hall (iris) state, focus state, focus motor speed, zoom ring position, etc.) for adjustment output from the AF microprocessor (IC613 on VC-60 board) into a 2-digit hexadecimal code and displays it on the LED.

Connections:
Connect as shown in the diagram below.

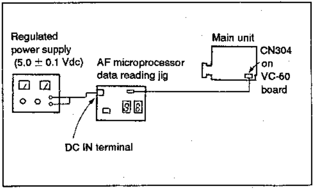

Regulated
power supply
(5.0 ± 0.1 Vdc)
AF microprocessor
data reading jig
Main unit
CN304
on
VC-60
board
DC IN terminal

Fig. 7-9.

7-1-7. Data Processing

For some of the adjustment items, calculation from the data (hexadecimal) indicated on the AF microprocessor data reading jig and adjustment remote commander is needed to obtain the adjustment data. In these cases, convert the hexadecimal values to decimal before calculation and reconvert the result to hexadecimal to obtain the adjustment data. A hexadecimal-decimal conversion table is shown in Table 7-5.

Hexadecimal-Decimal Conversion Table

Hexadecimal lower digit Hexadecimal upper digit	0	1	2	3	4	5	6	7	8	9	A (A)	B (b)	C (c)	② D (d)	E (E)	F (F)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	1412	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A(A)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
① B(b)	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
C(c)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D(d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E(E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F(F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note: ( ) is the indication on the jig or adjustment remote commander.

Example: The indication on the jig or adjustment remote commander is BD (b d).
As the upper digit is B (b) and the lower digit is D (d), a decimal value of 189 is obtained from the intersection of ① and ② in the above table.

Table 7-5.

7-2. CAMERA SYSTEM ADJUSTMENT

7-2-1. Flange Back Adjustment

Subject	Siemens star (2m directly in front of lens reference plane (CCD imager)
Measurement Point	Check with a monitor TV
Measuring Instrument	
Adjusting Element	Flange back adjusting pin
Tools	Phillips screwdriver, flat blade (–) screwdriver

Adjustment method:

1) Press the FOCUS switch (S759 on CF-4 board) to set to the MANUAL mode.
2) Position a Siemens star 2m directly in front of the lens reference plane (See Fig. 7-2.).
3) Orient the camera block to have the center of the Siemens star imaged on the monitor TV screen coincide with the monitor screen center.
4) Check to assure the smooth motion of the lens zoom lever to both its extreme WIDE position (11 mm) and TELE position (66 mm), and then set it at the extreme WIDE position. (In this process, also check the monitor image to assure proper zooming operation.)
5) Select adjustment address 37 with the adjustment remote commander and enter adjustment data of 07. (Iris open mode)
   At this time, adjust the illumination on the Siemens star or place an ND filter over the lens, and confirm that the proper image is displayed on the monitor TV screen.
6) Set the lens focusing mark at the center of "2".

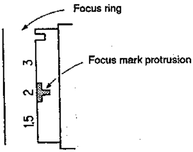


Fig. 7-10.

7) Loosen flange back setscrew ❶ with a Phillips screwdriver. (See Fig. 7-12.)
8) By turning the flange back adjusting pin ❷ while watching the monitor screen, attain the optimum definition of a wedge at the Siemens star center on the screen. (Turn it a few turns to the left and right to ensure optimum definition.)
   Note: Do not turn the adjusting pin excessively in either direction.
9) While holding the flange back adjusting pin ❷ to prevent further rotation, retighten the flange back setscrew ❶.
10) With the zoom lever fixed at its WIDE end, turn the focusing ring and set it to the position that provides the optimum definition image of the wedge. Check to assure the focusing mark protrusion position is within the range shown in Fig. 7-11. Also, rotate the focusing ring to the close (1.1m) and far (∞) extremes and confirm that the wedge is no longer in focus.

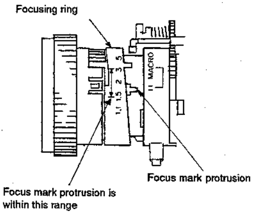


Fig. 7-11.

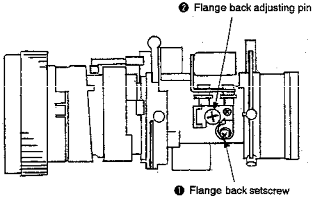


Fig. 7-12.

11) Fix the zoom lever at the extreme TELE position.
12) Turn the focusing ring and stop at the position where the wedge has optimum definition.
    Confirm that the focus mark is within ± 1.5 mm of "2".
13) Select adjustment address 37 with the adjustment remote commander and enter adjustment data of 00. (Iris normal)
14) Change the adjustment address to store the adjustment data in the memory.

7-2-2. Power Supply Check (VC-60 Board)

Measuring Instrument	Digital voltmeter
CAM 5V Check	
Measurement Point	Pin ④ of W801
Specified Value	$4.9^{+0.1}_{-0.07}$ Vdc
23V Check	
Measurement Point	Pin ① of W801
Specified Value	23.0 ± 1.5 Vdc
15V Check	
Measurement Point	Pin ② of W801
Specified Value	15.0 ± 0.45Vdc
− 9V Check	
Measurement Point	Pin ③ of W801
Specified Value	− 9.0 ± 0.5Vdc

Checking method:
1) Each power supply voltage should be at its specified level.

7-2-3. EVR Initial Settings

Set to the following initial settings of the adjustment data only when the EVR/AWB microprocessor (IC361 on VC-60 board) was replaced.

Adjustment Address	Adjustment Data Initial Value	Adjustment Address	Adjustment Data Initial Value	Adjustment Address	Adjustment Data Initial Value
01 (DELTA R)	50	44 (STEP)	00	67 (KEIKO R)	10
02 (DELTA B)	50	47 (HANT LIMIT)	00	68 (KEIKO B)	00
04 (C-PED)	A0	48 (FA BASE)	28	69 (BTM UP)	89
18 (SYNC LEVEL)	A0	49 (INCLINE)	06	70 (BTM DWN)	61
19 (SET UP)	A7	50 (TOP CHECK-THR)	00	71 (MDL UP)	7C
20 (WC)	FF	51 (BACK RUSH)	02	72 (MDL DWN)	6A
21 (Y LEVEL)	40	52 (TOP CHECK-SEARCH)	02	75 (KEIKO DWN)	8C
25(IRIS)	FF	53 (TOP LIMIT)	05	76 (R DWN LMT)	1E
28 (MAX GAIN)	B0	54(FOCUS MOTOR SPEED)	01	78 (R OUT LMT)	2D
29 (AGC)	FF	55(TOP CHECK COUNTER)	02	82 (BMDIV)	23
30 (V SUB)	40	56 (MODE 1 THR)	04	83 (D TM)	15
38 (LLA)	3F	59 (START R)	30	84 (F TM)	20
39 (MACRO)	00	60 (START B)	41	85 (CAM DDS O)	00
40 (IN/OUT DOOR)	01	61 (BTM SLP R)	22	86	00
41 (LOW CONT)	03	62 (BTM SLP B)	10	87	00
42 (BASE H)	03	63 (MDL SLP)	00	88 (CAM ALN)	00
43 (THR UP)	00	64 (MDL SLP B)	00	89 (AWB MODE)	00

Table 7-6.

Adjustment method:
1) Set the RV701 (HALL ADJ) on the LD-11 board to yhe mechanical center.
2) Set the adjustment data at the various adjustment addresses to the initial values using the adjustment remote commander.
3) Change the adjustment address to store the last adjustment data in the memory.

7-2-4. V SUB Adjustment (VC-60 Board)

Subject	Not needed
Measurement Point	Pin (B4) (V SUB) of check point array
Measuring Instrument	Digital voltmeter
Adjustment Address	30 (V SUB)
Specified Value	(Voltage indicated by the imager) ± 0.05 Vdc

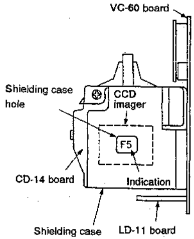
Adjustment method:

1) Set the adjustment address to 30 using the adjustment remote commander.
2) Change the adjustment data using the adjustment remote commander to set the VSUB voltage (Voltage indicated by the imager) to ± 0.05 Vdc.
3) Change the adjustment address to store the adjustment data in the memory.

Note: The VSUB specified voltage is expressed by two digits with the integer section abbreviation and decimal section by the imager.

Remove TI-15 board (CN803 on the VC-60 board) befor confirming the VSUB specified voltage.

integer section abbreviation	Integer value
7	7
8	8
9	9
A	10
B	11
C	12
D	13
E	14
F	15
G	16
H	17
I	18
J	19



(Example)
If F5 is indicated, the integer value is F → 15 and decimal value is 5 → 0.5.
Thus, the VSUB voltage is 15 + 0.5 = 15.5 (Vdc).

Fig. 7-13.

7-2-5. Hall Adjustment (LD-11 Board)

Subject	All black (cover lens with black cap)
Measurement Point	CN304 on the VC-60 board
Measuring Instrument	AF microprocessor data reading jig
Adjusment Address	27 (Hall Offset)
Adjusting Element	RV701
Specified Value	When iris closed: Minimum value of 01 to 04 When iris open: 3D or 3E

Adjustment method:

1) Set the adjustment address to 37 with the adjustment remote commander, and set the adjustment data to 05. (Setting when iris closed)
2) Change the adjustment address to 27.
3) Change the adjustment data until the indication on the AF microprocessor data reading jig is the minimum value in the range of 01 to 04. (Hall offset adjustment)
4) Change the adjustment address to 37 and set the adjustment data to 07. (Setting when iris open)
5) Adjust RV701 until the indication on the AF microprocessor data reading jig is either 3D or 3E. (3D is indicated as .)
6) Repeat steps 1) through 5) until the specified values are satisfied.
7) Set the adjustment address to 37 and set the adjustment data to 00. (Releases adjustment mode)
8) Change the adjustment address to store the adjustment data in the memory.

7-2-6. Iris Adjustment (VC-60 Board)

Subject	Color bar chart standard picture frame
Filter	ND filter 0.4 and 0.1
Measurement Point	Pin (B11) (CCD OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	25 (Iris)
Specified Value	360 ± 20 mVp-p

Adjustment method:

1) Set the adjustment address to 25 with the adjustment remote commander.
2) Without attaching an ND filter, change the adjustment data with the adjustment remote commander to set the IRIS OUT signal level to 360 ± 20 mVp-p.
3) Attach the ND filter 0.5 (0.4 + 0.1) to the front of the lens and confirm that there is a smooth change in the signal level.
4) Remove the ND filter and confirm that the signal level is 360 ± 20 mVp-p.
5) Repeat 2) through 4) if the specified value is not met.
6) Change the adjustment address to store the adjustment data in the memory.

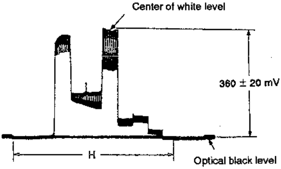


Fig. 7-14.

7-2-7. Iris In/Out Adjustment (VC-60 Board)

Subject	White pattern standard picture frame
Filter	ND filter 0.4 (two) and 0.1 (one)
Measurement Point	CN304
Measuring Instrument	AF microprocessor data reading jig
Adjustment Address	46 (hall level) 45 (hysteresis)

Adjustment method:

1) Cover the lens with the ND filter 0.8 (0.4+0.4).
2) Set the adjustment address to 37 with the adjustment remote commander and set the adjustment data to 09. (Hall in/out threshold mode setting)
3) Read the data indicated on the AF microprocessor data reading jig. This data will be a.
4) Change the adjustment address to 46 and enter a as the adjustment data.
5) Remove the ND filter 0.8 and replace it with ND filter 0.5 (0.4+0.1).
6) Read the data indicated on the AF microprocessor data reading jig. This data will be b.
7) Subtract data b from data a to obtain data c.
   (Refer to Table 7-5. Hexadecimal-Decimal Conversion Table)
   (Example)
   If a=1A and b=15, c=a–b =1A (26) – 15 (21) =05
   ( ) indicates decimal value
8) Obtain the hysteresis data from data c using the table below.

Data c	Hysteresis Data
02, 03	01
04, 05, 06	02
07, 08, 09	03

   (Example)
   The hysteresis data is 02 if c=05.

9) Change the adjustment address to 45 and enter the hysteresis data as the adjustment data.
10) Change the adjustment address to 37 and set the adjustment data to 00.
    (Releases hall in/out threshold mode)
11) Change the adjustment address to store the adjustment data in the memory.

7-2-8. AGC Adjustment (VC-60 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin B3 (Y (LPF) OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	29 (AGC)
Specified Value	160 ± 5 mVp-p

Adjustment method:

1) Set the adjustment address to 29 using the adjustment remote commander.
2) Change the adjustment data with the adjustment remote commander to set the Y (LPF) signal level to 160 ± 5 mVp-p.
3) Change the adjustment address to store the adjustment data in the memory.

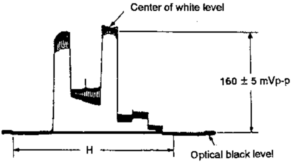


Fig. 7-15.

7-2-9. Y Signal Matrix Adjustment (VC-60 Board)

Subject	Color bar standard picture frame
Measurement Point	1: Pin A4 (Y0) of check point array 2: Pin A5 (Y1) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	14 (Y1 GAIN)
Specified Value	Y1 signal level=Y0 signal level

Adjustment method:

1) Connect the oscilloscope to Pin A4 of the check point array and measure the Y0 signal level.
2) Connect the oscilloscope to Pin A5 of the check point array.
3) Set the adjustment address to 14 using the adjustment remote commander.
4) Change the adjustment data until the Y1 signal level is the same as the Y0 signal level measured in 1).
5) Change the adjustment address to store the adjustment data in the memory.

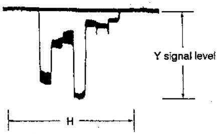


Fig. 7-16.

7-2-10. Chroma Signal Matrix Adjustment (1) (VC-60 Board)

Subject	Color bar standard picture frame
Measurement Point	1: Pin (A6) (C0) of check point array 2: Pin (A7) (C1) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	13 (C1 GAIN)
Specified Value	C1 signal level=C0 signal level

Adjustment method:

1) Connect the oscilloscope to Pin (A6) of the check point array and measure the C0 signal level. (The C0 signal level is the larger of the CR and CB signal levels.)
2) Connect the oscilloscope to Pin (A7) of the check point array.
3) Set the adjustment address to 13 using the adjustment remote commander.
4) Change the adjustment data until the C1 signal level is the same as the C0 signal level measured in 1).
5) Change the adjustment address to store the adjustment data in the memory.

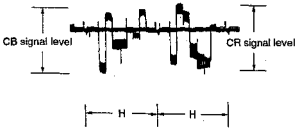


Fig. 7-17. C0 and C1 signal levels

7-2-11. Chroma Signal Matrix Adjustment (2) (VC-60 Board)

Subject	Color bar standard picture frame
Measurement Point	CH1 (X): emitter of Q257 (B-Y) CH2 (Y): emitter of Q255 (R-Y)
Measuring Instrument	Oscilloscope (X-Y mode)
Adjustment Address	24 (C2 GAIN)
Specified Value	Separate color luminance points become one.

Note: Adjustment can be made in the same manner using a vectorscope.
(Vectorscope connection terminal: video input/output terminal)

Adjustment method:

1) Set the adjustment address to 24 using the adjustment remote commander.
2) Change the adjustment data so that the two separate color luminance points become one respectively.
3) Change the adjustment address to store the adjustment data in the memory.

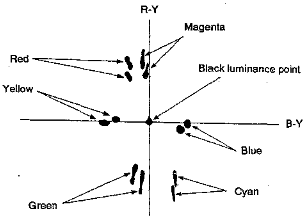


Fig. 7-18.

7-2-12. YH Level Adjustment (VC-60 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (A9) (YH) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	23 (YH LEVEL)
Specified Value	900 ± 40 mVp-p

Adjustment method:
1) Set the adjustment address to 23 with the adjustment remote commander.
2) Change the adjustment data with the adjustment remote commander to set the YH signal level to 900 ± 40 mVp-p.
3) Change the adjustment address to store the adjustment data in the memory.

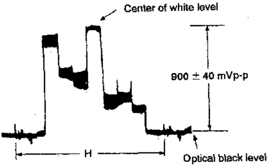


Fig. 7-19.

7-2-13. Sync Level Adjustment (VC-60 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin (A8) (CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	18 (SYNC LEVEL)
Specified Value	285 ± 5 mVp-p

Adjustment method:
1) Set the adjustment address to 18 with the adjustment remote commander.
2) Change the adjustment data with the adjustment remote commander to set the sync level to 285 ± 5 mVp-p.
3) Change the adjustment address to store the adjustment data in the memory.

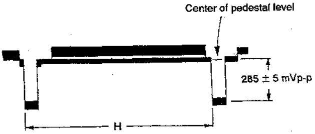


Fig. 7-20.

7-2-14. Setup Adjustment (VC-60 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin (A8) (CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	19 (SET UP)
Specified Value	50 ± 10 mV

Note: 1) and 2) are steps taken to reduce noise.

Adjustment method:
1) Set the address to 22 (APERTURE) with the adjustment remote commander, and enter 00 as the adjustment data after making a note of the adjustment data for this address.
2) Set the address to 28 (MAX GAIN) with the adjustment remote commander, and enter 00 as the adjustment data after making a note of the adjustment data for this address.
3) Set the adjustment address to 21 (Y LEVEL) with the adjustment remote commander, and enter 90 as the adjustment data after making a note of the adjustment data for this address.
4) Set the adjustmenyt address to 19 with the adjustment remote commander.
5) Change the adjustment data with the adjustment remote commander to set the setup level to 50 ± 10 mV.
6) Set the adjustment address to 22 and enter the adjustment data recorded in 1).
7) Set the adjustment address to 28 and enter the adjustment data recorded in 2).
8) Set the adjustment address to 21 and enter the adjustment data recorded in 3).
9) Change the adjustment address to store the adjustment data in the memory.

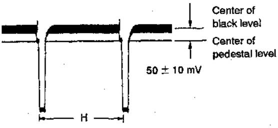


Fig. 7-21.

7-2-15. Y Level Adjustment (VC-60 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (A8) (CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	21(Y LEVEL)
Specified Value	650 ± 10 mV

Adjustment method:

1) Set the adjustment address to 20 with the adjustment remote commander, and make a note of the adjustment data for this address.
2) Set the adjustment data to FF with the adjustment remote commander.
3) Set the adjustment address to 21 with the adjustment remote commander.
4) Change the adjustment data with the adjustment remote commander to set the Y signal level to 650 ± 10 mV.
5) Set the adjustment address to 20 and enter the adjustment data recorded in 1).
6) Change the adjustment address to store the adjustment data in the memory.

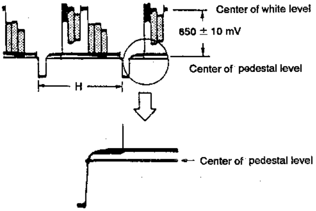


Fig. 7-22.

7-2-16. White Clip Adjustment (VC-60 Board)

Subject	High luminance pattern
Measurement Point	Pin (A8) (CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	20 (WHITE CLIP)
Specified Value	840 ± 20 mV

Adjustment method:

1) Set the adjustment address to 20 with the adjustment remote commander.
2) Change the adjustment data with the adjustment remote commander to set the white clip level to 840 ± 20 mV.
3) Change the adjustment address to store the adjustment data in the memory.

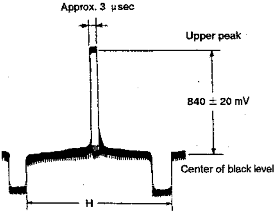


Fig. 7-23.

7-2-17. Aperture Adjustment (VC-60 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (A8) (CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	22 (APERTURE)
Specified Value	240 ± 10 mV

Adjustment method:

1) Set the adjustment address to 22 with the adjustment remote commander.
2) Focus the camera and set the aperture level (lower peak between green and white) to maximum.
3) Change the adjustment data to set the lower peak between green and white to 240 ± 10 mV above the pedestal level.
4) Change the adjustment address to store the adjustment data in the memory.

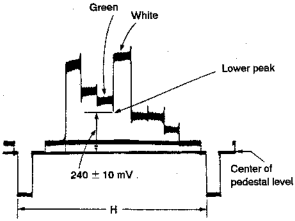


Fig. 7-24.

7-2-18. Max. Gain Adjustment (VC-60 Board)

Subject	Color bar chart standard picture frame
Filter	ND filters 1.0 (two) and 0.3 (one)
Measurement Point	Pin (A8) (CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	28 (MAX GAIN)
Specified Value	360 ± 10 mV

Adjustment method:

1) Cover the lens with the ND filter 2.3 (1.0 + 1.0 + 0.3).
2) Set the adjustment address to 28 with the adjustment remote commander.
3) Change the adjustment data with the adjustment remote commander to set the Y signal level to 360 ± 10 mV.
4) Change the adjustment address to store the adjustment data in the memory.

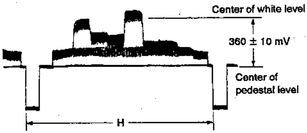


Fig. 7-25.

7-2-19. Chroma Level Adjustment (VC-60 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (A1) (G OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	09 (C LEVEL)
Specified Value	320 ± 20 mVp-p

Connections:

1) Connect Pin (B7) (MODE) of the check point array to GND using a jumper wire.

Adjustment method:

1) Set the adjustment address to 09 with the adjustment remote commander.
2) Change the adjustment data with the adjustment remote commander to set the G OUT signal level to 320 ± 20 mVp-p.
3) Change the adjustment address to store the adjustment data in the memory.

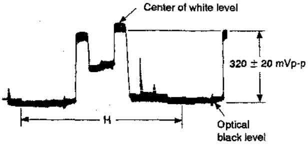


Fig. 7-26.

7-2-20. Burst Level Adjustment (VC-60 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin (A10) (CAM C) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	16 (BURST LEVEL)
Specified Value	190 ± 5 mVp-p

Adjustment method:

1) Set the adjustment address to 16 with the adjustment remote commander.
2) Change the adjustment data with the adjustment remote commander to set the burst level to 190 ± 5 mVp-p.
3) Change the adjustment address to store the adjustment data in the memory.

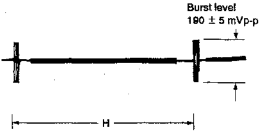


Fig. 7-27.

7-2-21. Indoor White Balance Adjustment (Method using vectorscope)

Subject	Color bar chart standard picture frame
Measurement Point	Video input/output terminals
Measuring Instrument	Vectorscope
Adjustment Address	11 (R GAIN) 12 (B GAIN)
Specified Value	The center of the white luminance point is within a circle with a diameter of 1 mm centered around the origin.

Adjustment method:

1) Set the adjustment address to 11 with the adjustment remote commander.
2) Change the adjustment data with the adjustment remote commander to move the white luminance point to the origin point.
3) Set the adjustment address to 12.
4) Change the adjustment data to move the white luminance point to the origin point.
5) Repeat steps 1) through 4).
6) Change the adjustment address to store the adjustment data in the memory.

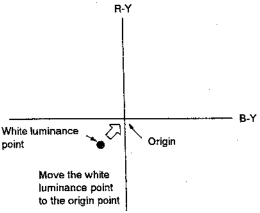

R-Y
B-Y
White luminance point
Origin
Move the white luminance point to the origin point

Fig. 7-28.

7-2-22. Indoor White Balance Adjustment (Method using oscilloscope) (VC-60 Board)

Subject	Color bar chart standard picture frame
Measurement Point	CH1 (X): emitter of Q257 (B-Y) CH2 (Y): emitter of Q255 (R-Y)
Measuring Instrument	Oscilloscope (X-Y mode)
Adjustment Address	11 (R GAIN) 12 (B GAIN)
Specified Value	Move the white luminance point to the black luminance point.

Adjustment method:

1) Set the adjustment address to 11 with the adjustment remote commander.
2) Change the adjustment data with the adjustment remote commander to move the white luminance point with the black luminance point.
3) Set the adjustment address to 12.
4) Change the adjustment data to move the white luminance point to the black luminance point.
5) Repeat steps 1) through 4).
6) Change the adjustment address to store the adjustment data in the memory.

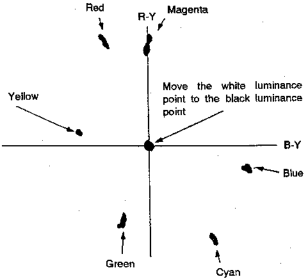

Red
R-Y
Magenta
Yellow
Move the white luminance point to the black luminance point
B-Y
Blue
Green
Cyan

Fig. 7-29.

7-2-23. Color Reproduction Adjustment (Method Using Vectorscope)

Subject	Color bar chart standard picture frame
Measurement Point	Video input/output terminals
Measuring Instrument	Vectorscope
Adjustment Address	05 (R-Y GAIN) 06 (B-Y GAIN) 07 (B-Y HUE) 08 (R-Y HUE)
Specified Value	All color luminance points are within color reproduction frame.

Note: Confirm that Burst Level Adjustment and Indoor White Balance Adjustment have been completed.

Adjustment method:

1) Adjust the phase and gain of the vectorscope to set the burst luminance points to the designated position on the color reproduction frame.
2) Change the adjustment data at the various adjustment addresses using the adjustment remote commander until all color luminance points are within the color reproduction frame.
3) Change the adjustment address to store the adjustment data in the memory.

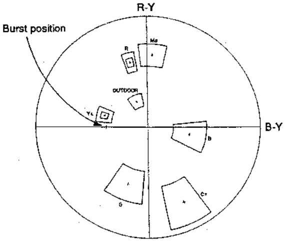


Fig. 7-30.

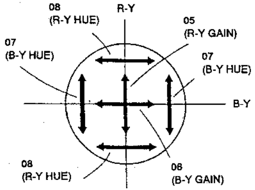


Fig. 7-31. Adjustment Address and Direction of Luminance Point Movement

7-2-24. Color Reproduction Adjustment (Method Using Oscilloscope)

1. Gain adjustment (VC-60 board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (A10) (CAM C) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	05 (R-Y GAIN) 06 (B-Y GAIN)
Specified Value	Red level: 285 ± 15 mVp-p Yellow level: 190 ± 12 mVp-p

Note: Confirm that Indoor White Balance Adjustment has been completed.

Adjustment method:

1) Set the adjustment address to 06 with the adjustment remote commander and set the adjustment data to B0.
2) Set the adjustment address to 07 and set the adjustment data to C0.
3) Set the adjustment address to 08 and set the adjustment data to C0.
4) Set the adjustment address to 05 and change the adjustment data to set the chroma signal red level to 285 ± 15 mVp-p.
5) Set the adjustment address to 06 and change the adjustment data to set the chroma signal yellow level to 190 ± 12 mVp-p.
6) Repeat steps 4) and 5).
7) Change the adjustment address to store the adjustment data in the memory.
8) Perform Hue Adjustment.

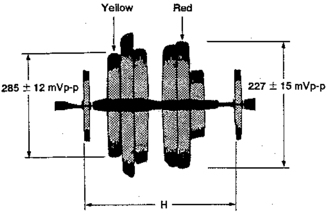


Fig. 7-32.

2. Hue adjustment (VC-60 board)

Subject	Color bar chart standard picture frame
Measurement Point	CH1 (X): emitter of Q257 (B-Y) CH2 (Y): emitter of Q255 (R-Y)
Measuring Instrument	Oscilloscope (X-Y mode)
Adjustment Address	07 (B-Y HUE) 08 (R-Y HUE)
Specified Value	Various color luminance points within color reproduction frame.

Note: Make sure that Indoor White Balance Adjustment has been completed.

Adjustment method:

1) Move the black luminance point on the oscilloscope to the origin point of the color reproduction frame.
2) Change the adjustment data at adjustment addresses 07 and 08 with the adjustment remote commander to bring the various color luminance points into the color reproduction frame.
3) Check the hue reproduced on the monitor TV and fine adjust the adjustment data at adjustment addresses 07 and 08 if necessary.
4) Change the adjustment address to store the adjustment data in the memory.

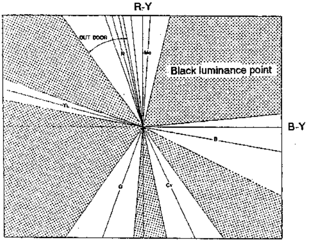


Fig. 7-33.

7-2-25. Auto White Balance Adjustment

Note: Be sure to first perform Preset Adjustment followed by Auto White Balance Adjustment.

1. Preset adjustment (VC-60 board)

Subject	White pattern standard picture frame
Measurement Point	Pin B3 (Y LPF OUT) of check point array
Measuring Instrument	Oscilloscope

Note: 1) Perform preset adjustment after supplying power to the unit for at least 30 seconds.
2) When performing preset adjustment again, repeat after first turning the power off and then back on.

Preparations:

1) Prepare a 1 kΩ resistor for connecting Pin B5 (AW ADJ) of the check point array and Pin ④ (CAM 5V) of W801.

Adjustment method:

1) Turn the power OFF and then ON.
2) Select adjustment address 89 (AWB MODE) and set the adjustment data to E0. Wait at least five seconds.
3) Change the adjustment address to store the adjustment data in the memory. Wait at least five seconds.
4) Remove the jumper wire between Pin B6 (CAM ADJ) of the check point array and GND.
5) Connect Pin B5 (AW ADJ) of the check point array and Pin ④ of W902 (CAM 5V)with a 1 kΩ resistor.
6) Connect Pin B6 (CAM ADJ) of the check point array to GND using a jumper wire.
7) Confirm that the indication (adjustment address 01) of the adjustment remote commander is changed.
8) Remove the jumper wire connected to Pin B6 (CAM ADJ) of the check point array after allowing one second or more to elapse.
9) Remove the 1 kΩ resistor connected to Pin B5 (AW ADJ) of the check point array.
10) Connect Pin B6 (CAM ADJ) of the check point array to GND using a jumper wire.

2. Auto white balance adjustment (VC-60 board)

Note: Be sure to perform this adjustment after completing Preset Adjustment.

Subject	White pattern standard picture frame
Filter	Filter C14 (C12+C2) for color black temperature correction
Measuring Instrument	Oscilloscope (X-Y Mode)
Measurement Point	CH1 (X): emitter of Q257 (B-Y) CH2 (Y): emitter of Q255 (R-Y)
Adjustment Address	01 (DELTA R) 02 (DELTA B) 80 (R OUTDOOR) 81 (B OUTDOOR) 77 (B UP LIMIT) 78 (R OUT LIMIT) 79 (B OUT LIMIT) 65 (TOP SLP R) 66 (TOP SLP B) 73 (TOP UP) 74 (TOP DWN)
Specified Value	Line up the white luminance point with the black luminance point.

Note: 1) Make connection to the video input/output terminals when the vectorscope is used.
2) All calculations in this section are made in decimal.

Adjustment method:

1) Select adjustment address 89 (AWB MODE) with the adjustment remote commander and enter adjustment data of 10.
2) Change the adjustment data of adjustment addresses 01 and 02 with the adjustment remote commander to move the white luminance point to the black luminance point.
(Move the white luminance point to the origin point when using the vectorscope.)
The adjustment data of adjustment address 01 is D_1 and the adjustment data of adjustment address 02 is D_2.
3) Convert adjustment data D_1 to decimal to obtain D_1'.
Convert adjustment data D_2 to decimal to obtain D_2'.
(See Table 7-5 Hexadecimal-Decimal Conversion Table)
4) Obtain D_{80}' and D_{81}' by the following formulas.
$D_{80}'=D_1'+1$
$D_{81}'=D_2'+3$
5) Convert D_{80}' and D_{81}' to hexadecimal and call these values D_{80} and D_{81}.
6) Select adjustment address 80 with the adjustment remote commander and enter adjustment data D_{80}.
7) Select adjustment address 81 with the adjustment remote commander and enter adjustment data D_{81}.
8) Obtain D_{77}' by the following formula.
$D_{77}'=(D_2' \times 1.9) - 43.2$
9) Convert D_{77}' to hexadecimal and call this value D_{77}.
(Round off the decimal portion)
10) Select adjustment address 77 with the adjustment remote commander and enter adjustment data D_{77}.
11) Select adjustment address 78 with the adjustment remote commander and enter adjustment data D_1.
12) Obtain D_{79}' by the following formula.
$D_{79}'=D_2'+10$
13) Convert D_{79}' to hexadecimal and call this value D_{79}.
14) Select adjustment address 79 with the adjustment remote commander and enter adjustment data D_{79}.
15) Obtain d' by the following formula.
$d'=(D_1' \times 5)+D_2'$
The adjustment procedure in 16) through 18) varies according to the value of d'.

[d' > 308]

16) Obtain D_{73}' and D_{74}' by the following formulas.
$D_{73}'=(D_1' \times 3)+(D_2' \div 2)+30$
$D_{74}'=D_{73}'-42$
17) Convert D_{73}' and D_{74}' to hexadecimal and call these values D_{73} and D_{74}.
(Round off the decimal portion)
18) Use the adjustment remote commander to enter the adjustment data shown in the table below for the indicated adjustment addresses.

Adjustment address	Adjustment data
65	20
66	01
73	D_{73}
74	D_{74}

Perform the adjustment steps beginning from 19).

[308 ≧ d' ≧ 286]

16) Obtain D_{73}' and D_{74}' by the following formulas.
$D_{73}'=(d' \div 2)+25$
$D_{74}'=D_{73}'-39$
17) Convert D_{73}' and D_{74}' to hexadecimal and call these values D_{73} and D_{74}.
(Round off the decimal portion)
18) Use the adjustment remote commander to enter the adjustment data shown in the table below for the indicated adjustment addresses.

Adjustment address	Adjustment data
65	41
66	01
73	D_{73}
74	D_{74}

Perform the adjustment steps beginning from 19).

[286 > d']

16) Obtain D_{73}' and D_{74}' by the following formulas.
$D_{73}'=(D_1' \times 3) \div D_2'+30$
$D_{74}'=D_{73}'-42$
17) Convert D_{73}' and D_{74}' to hexadecimal and call these values D_{73} and D_{74}. (Round off the decimal portion)
18) Use the adjustment remote commander to enter the adjustment data shown in the table below for the indicated adjustment addresses.

Adjustment address	Adjustment data
65	20
66	00
73	D_{73}
74	D_{74}

19) Select adjustment address 89 and enter adjustment data 00.
20) Select adjustment address 89 and enter adjustment data F0.
21) Change the adjustment data of adjustment addresses 01 and 02 with the adjustment remote commander to move the white luminance point to the black luminance point.
(Move the white luminance point to the origin point when using the vectorscope.)
22) Select adjustment address 89 and enter adjustment data of 00.
23) Change the adjustment address to store the adjustment data in the memory.

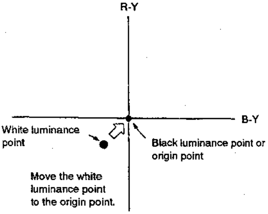

R-Y
B-Y
White luminance point
Black luminance point or origin point
Move the white luminance point to the origin point.

Fig. 7-34.

(Example)
When the adjustment data obtained in Step 2) has the following values.

Adjustment address	Adjustment data
01	2A
02	53

→ Enter into adjustment address 78

D_1=2A and D_2=53 when there is conversion to decimal using Table 7-5.
$D_1'=42$
$D_2'=83$

In the same manner,
$D_{77}'=(83 \times 1.9)-43.2=114.5$

Rounding off the decimal portion,
$D_{77}=73$ → Entered into adjustment address 77
Thus,
$D_{80}'=42+1=43$
$D_{81}'=83+3=86$
Converting to hexadecimal by Table. 7-5 results in,
D_{80}=2B → Entered into adjustment address 80
$D_{81}=56$ → Entered into adjustment address 81
$D_{79}'=(83+10)=93$
D_{79}=5D → Entered into adjustment address 79

In addition,
$d'=(42 \times 5)+83=293$

Thus, $[308 \geqq d' \geqq 286]$
$D_{73}'=(293 \div 2)+25=171.5$
$\therefore$ D_{73}=AC → Entered into adjustment address 73
$D_{74}'=171.5-39=132.5$
$\therefore$ $D_{74}=85$ → Entered into adjustment address 74

Also, adjustment data of 41 is entered into adjustment address 65, and adjustment data of 01 is entered into adjustment address 66.
The steps beginning from 19) are then performed.

7-2-26. Outdoor White Balance Confirmation (VC-60 Board)

Subject	White pattern standard picture frame
Filter	Filter C14 (C12+C2) for color temperature correction
Measurement Point	When vectorscope used: video input/output terminals
Measuring Instrument	When oscilloscope used: CH1 (X): emitter of Q257 (B-Y) CH2 (Y): emitter of Q255 (R-Y)
Specified Value	See Fig. 7-35.

Connections:

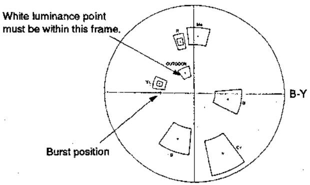
1) Remove the jumper wire connected to Pin (B6) (CAM ADJ) of the check point array. (Turns off the EVR adjustment mode)

Checking method:

1) Press the white balance button to select the outdoor white balance mode. (☀ mark is displayed on EVF screen.)
2) Confirm that the center of the white luminance point is within the OUTDOOR frame of the color reproduction frame.

   Note: When using a vectorscope, adjust the GAIN and PHASE of the vectorscope so that burst luminance point move to the burst position of the color reproduction frame.

(When using vectorscope)



(When using oscilloscope)

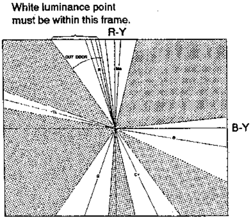


Fig. 7-35.

7-2-27. Focus Motor Speed Adjustment (VC-60 Board)

Subject	Arbitrary
Measurement Point	CN304
Measuring Instrument	AF microprocessor data reading jig
Adjustment Address	26 (FOCUS SPEED)
Specified Value	Average value of data indicated on jig=7.0 ± 0.5

Remarks: The rotation time from the close extreme to far extreme of the focus ring should be approximately 2.1 seconds after completion of adjustment.

Adjustment method:

1) Select adjustment address 37 with the adjustment remote commander and enter adjustment data of 01. (Sets hunching mode)
2) Set the adjustment address to 26.
3) Change the adjustment data so that the indication on the AF microprocessor data reading jig is 07 while the ring is rotating.
4) Press the HOLD button of the AF microprocessor data reading jig while the focus ring is rotating to read the indication value.
5) Repeat step 4) ten times and obtain the average value.
   Specified value=7.0 ± 0.5
   Repeat steps 3) and 4) if the specified value is not satisfied.
6) Set the adjustment address to 37 and set the adjustment data to 00. (Releases hunching mode)
7) Change the adjustment address to store the adjustment data in the memory.

7-2-28. Macro Area Adjustment (VC-60 Board)

Subject	Arbitrary
Measurement Point	CN304
Measuring Instrument	AF microprocessor data reading jig
Adjustment Address	39 (MACRO)
Specified Value	(Value at zoom ring WIDE position) -1

Adjustment method:

1) Set the zoom ring to the WIDE position (11 mm position).
2) Select adjustment address 37 with the adjustment remote commander and set the adjustment data to 03. (Sets zoom position indication mode)
3) Read the data indicated on the AF microprocessor data reading jig. (Data in the range of 06 to 0E is displayed if normal.)
4) Change the adjustment address to 39.
5) Subtract 1 from the data read from the jig and enter as the adjustment data. (See Table 7-5. Hexadecimal-Decimal Conversion Table)
6) Change the adjustment address to 37 and set the adjustment data to 00. (Releases zoom position indication mode)
7) Change the adjustment address to store the adjustment data in the memory.

7-2-29. Auto-Focus LLA Adjustment (VC-60 Board)

Subject	All black (cover lens with black cap)
Measurement Point	CN304
Measuring Instrument	AF microprocessor data reading jig
Adjustment Address	38 (LLA)
Specified Value	(Value indicated on jig) -2

Adjustment method:

1) Select adjustment address 37 with the adjustment remote commander and set to 0B as the adjustment data. (Sets auto-focus LLA adjustment mode)
2) Read the data indicated on the AF microprocessor data reading jig and call this value D.
3) Subtract 2 from D and make this value the LLA data.
(See Table 7-5. Hexadecimal-Decimal Conversion Table)

(Example)
When D=30 (48), LLA data is 2E (46)
When D=31 (49), LLA data is 2F (47)
( ) is decimal equivalent

4) Select adjustment address 38 with the adjustment remote commander and enter the LLA data as the adjustment data.
5) Select adjustment address 37 and set 00 as the adjustment data. (Releases auto-focus LLA adjustment mode)
6) Change the adjustment address to store the adjustment data in the memory.

7-2-30. Auto-Focus Adjustment

Subject	All black (cover lens with black cap)
Measurement Point	CN304
Measuring Instrument	AF microprocessor data reading jig
Adjustment Address	42 (BASE-H)

Adjustment method:

1) Turn off the auto-focus with the FOCUS button (S759 on CF-4 board).
2) Select adjustment address 37 with the adjustment remote commander and enter adjustment data of FF.
3) Read the indication on the AF microprocessor data reading jig and call this value D.
4) Obtain adjustment data D_{42} according to the following formulas.
When D=0
D_{42}=03
When D > 0
D_{42}=D+2 * Hexadecimal calculations
5) Select adjustment address 42 with the adjustment remote commander and enter D_{42} as the adjustment data.
6) Select adjustment address 37 and enter adjustment data of 00.
7) Change the adjustment address to store the adjustment data in the memory.

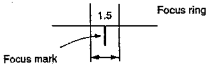
7-2-31. Auto-Focus Confirmation

Subject	Siemens star (position 1.5m from the front of the lens reference plane (CCD imager)

Note: Perform adjustment with the EVF (electronic viewfinder) attached.

Measuring method:

1) Place the Siemens star 1.5m from the front of the lens reference plane (See Fig. 7-2.).
2) Set the zoom lever to the TELE position (54 mm) and turn on auto focus with the FOCUS button.
3) Adjust the position of the camera so that center of the Siemens star is lined up with the center of the monitor screen on the monitor TV screen.
4) To open the iris, reduce the illumination of the Siemens star to the range in which the ■ mark in the upper center of the EVF screen does not light up.
(Or cover lens with the ND filter)
5) Turn off the auto-focus with the FOCUS button.
6) Manually rotate the focus ring to set the focus. Confirm that the focus mark is inside the range shown in Fig. 7-36. at this time.
Perform Flange Back Adjustment if this condition is not satisfied.
7) Rotate the focus ring to the close extreme (1.1m).
8) Turn on the auto-focus with the FOCUS button.
9) Confirm that there is focusing within two seconds and a sharp image can be obtained.
10) Turn off the auto-focus and rotate the focusring to the far extreme (∞).
11) Turn on the auto-focus.
12) Confirm that there is focusing within two seconds and a sharp image can be obtained.



Confirm that focus mark is within this range

Fig. 7-36.

7-2-32. Y FM Carrier Frequency Adjustment (VC-60 Board)

Subject	All black (cover lens with black cap)
Mode	Camera recording
Measurement Point	TP161 on VS-22 board
Measuring Instrument	Frequency counter
Adjusting Element	RV503
Specified Value	4.24 ± 0.04 MHz

Connections:

1) Connect the positive side (white band side) of C517 and GND (Pin ③ of W303) using a jumper wire.

Adjustment method:

1) Adjust RV502 to 4.24 ± 0.04 MHz.
2) Be sure to perform deviation adjustment.

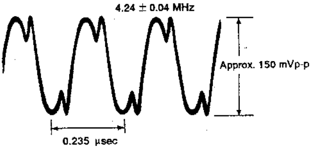


Fig. 7-37. Y FM carrier frequency adjustment

7-2-33. VCO Adjustment (VC-60 Board)

Subject	Arbitrary
Measurement Point	See Fig. 7-42.
Measuring Instrument	Digital voltmeter
Adjusting Element	CT141
Specified Value	2.8 ± 0.2 Vdc

Adjustment method:

1) Set to 2.8 ± 0.2 Vdc with CT141.

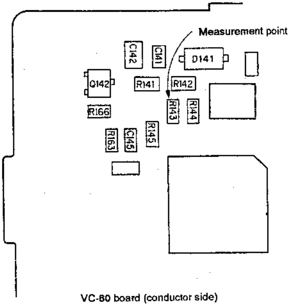

Measurement point
C142
C141
D141
Q142
R141
R142
R166
R143
R144
R163
C145
R145
VC-60 board (conductor side)

Fig. 7-38. VCO adjustment

7-2-34. Y FM Deviation Adjustment (VC-60 Board)

Subject	All black (cover lens with black cap)
Mode	Camera recording and playback
Signal	All black signal recorded with the camera Alignment tape for checking operation (WR5-4NSP) Color bar section
Measurement Point	Video input/output terminal
Measuring Instrument	Oscilloscope
Adjusting Element	RV503
Specified Value	(Horizontal sync signal level of alignment tape) ± 0.014V

Note: 1) Confirm that "9-4-8. PB Y Level 1 Adjustment", "9-4-9. PB Y Level 2 Adjustment" and "7-2-32. Y FM Carrier Frequency Adjustment" of the video block adjustment have been completed.

2) Terminate the video input/output terminal (J901) at 75Ω.

Adjustment method:

1) Play the color bar section of the alignment tape (WR5-4NSP) and make a note of the horizontal sync signal level (approx. 0.286V) at this time.
2) Record the all black subject with the camera.
3) Play back the tape recorded in step 2).
4) Confirm that the horizontal sync signal level at this time is the same as the level noted in step 1).
Specified value:
(Horizontal sync signal level of alignment tape) ± 0.014V
5) If the specified value is not satisfied, repeat 2) to 4) after turning RV503 in the following manner.

	Rotation direction of RV503
When smaller than specified value	Counterclockwise (↺)
When larger than specified value	Clockwise (↻)

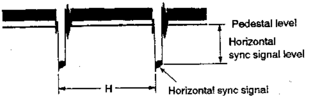


Fig. 7-39. Y FM deviation adjustment

7-2-35. Chroma Input Level Adjustment (VC-60 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin ① of IC503
Measuring Instrument	Oscilloscope
Adjusting Element	RV501
Specified Value	420 ± 10 mVp-p

Adjustment method:

1) Adjust the burst signal level to 420 ± 10 mVp-p using RV501.

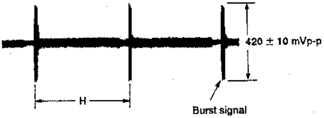


Fig. 7-40. Chroma input level adjustment

7-2-36. Recording Chroma RF Level Adjustment (VC-60 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin ① of W303
Measuring Instrument	Oscilloscope
Adjusting Element	RV504
Specified Value	240 ± 10 mVp-p

Adjustment method:

1) Adjust the burst signal level to 240 ± 10 mVp-p using RV504.

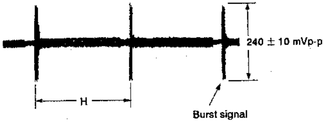


Fig. 7-41. Recording chroma RF level adjustment

7-2-37. REC Y Level Adjustment (VC-60 Board)

Subject	All black (cover lens with black cap)
Mode	Camera recording
Measurement Point	TP161 on VS-22 board
Measuring Instrument	Oscilloscope
Adjusting Element	RV505
Specified Value	150 ± 10 mVp-p

Connection:
1) Connect the positive side (white band side) of C517 and GND (Pin ③ of W303) using a jumper wire.

Adjustment method:
1) Adjust to 150 ± 10 mVp-p using RV505.

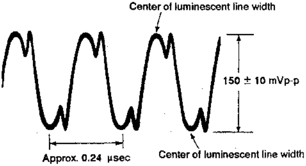

Center of luminescent line width
150 ± 10 mVp-p
Approx. 0.24 µsec
Center of luminescent line width

Fig. 7-42. REC Y level adjustment

7-3. DIGITAL TITLER SYSTEM ADJUSTMENT

7-3-1. Titler PLL Adjustment (TI-15 Board)

Subject	Arbitrary
Measurement Point	TP804
Measuring Instrument	Digital voltmeter
Adjusting Element	CT801
Specified Value	2.5 ± 0.1 Vdc

Connection:
1) Connect TP801 (PLL ADJ) and TP803 (VDD) with a jumper wire.

Adjusting method:
1) Set to 2.5 ± 0.1 Vdc with CT801.

7-3-2. Title A/D Level Adjustment

Subject	Color bar chart standard picture frame
Measurement Point	Confirmed on monitor TV
Measuring Instrument	
Adjustment Address	15 (TITLE A/D)
Specified Value	Blue and black areas are superimposed (become white). Other areas do not change.

Note: Make sure that "Y Level Adjustment" has been completed.

Adjustment method:
1) Select adjustment address 15 with the adjustment remote commander.
2) Press the MEMORY button (S762 on CF-4 board).
3) Confirm that blue and black areas are superimposed and become white, and that red and magenta areas do not change.
4) If this condition is not satisfied, change the adjustment data with the adjustment remote commander and repeat steps 2) and 3).
5) Change the adjustment address to store the adjustment data in the memory.

Shaded area must change to white.

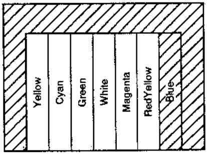


Fig. 7-43.

7-3-3. Title Pedestal Adjustment (VC-60 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin (A10) (CAM C) of check point array or video input/output terminal
Measuring Instrument	Oscilloscope
Adjustment Address	03 (PED)
Specified Value	3.58 MHz minimum chroma component

Note: Connect the EVF (electronic viewfinder) for adjustment.

Adjustment method:

1) Cover the lens with the black cap and press the MEMORY button (S762 on CF-4 board).
2) Confirm that "T WHT" characters are displayed in the EVF. (If another color is indicated, press the COLOR button (S763 on CF-4 board) until "T WHT" is indicated.)
3) Select adjustment address 03 with the adjustment remote commander.
4) Change the adjustment data with the adjustment remote commander to set the 3.58 MHz chroma component to minimum amplitude.
5) Change the adjustment address to store the adjustment data in the memory.

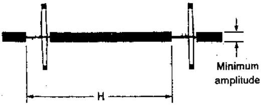


Fig. 7-44.

7-3-4. Title Y Level Adjustment (VC-60 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin (A8) (CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	10 (TITLE Y)
Specified Value	570 ± 40 mV

Note: Connect the EVF (electronic viewfinder) for adjustment.

Adjustment method:

1) Cover the lens with the black cap and press the MEMORY button (S657 on CF-4 board).
2) Confirm that "T WHT" characters are displayed in the EVF.
3) Select adjustment address 10 with the adjustment remote commander.
4) Change the adjustment data with the adjustment remote commander to set the Y signal level to 570 ± 40 mV.
5) Change the adjustment address to store the adjustment data in the memory.

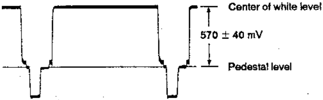


Fig. 7-45.

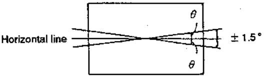
7-4. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT

7-4-1. Horizontal Tilt Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-4NSP) Monoscope portion
Specified Value	See Fig. 7-46.

Adjustment method:

1) By turning RV954 (BRIGHT), adjust for a luminance level which provides appropriate visibility of the CRT screen.
2) Loosen the DY (deflection yoke) tightening nut.
3) Make the image horizontal by rotating DY.
4) Retighten the DY tightening nut. (Do not tighten excessively.)


θ
Horizontal line
± 1.5°
θ

Specified value:
Image orientation within ±1.5° of horizontal line.

Fig. 7-46.

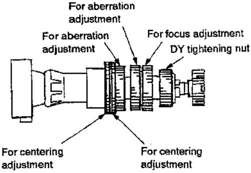

For aberration adjustment
For aberration adjustment
For focus adjustment
DY tightening nut
For centering adjustment
For centering adjustment

Fig. 7-47.

7-4-2. Centering Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-4NSP) Monoscope portion
Specified Value	See Fig. 7-48.

Adjustment method:

1) Turn the centering adjustment rings to provide an image with even right, left, upper and lower margins. (See Fig. 7-47.)

Note: Since the centering position is affected by the earth magnetism, turn the equipment over 360° horizontally, and make adjustments at the orientation which exhibits median displacements of the image.

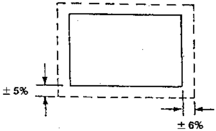


Fig. 7-48.

7-4-3. Focus Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-4NSP) Monoscope portion

Adjustment method:

1) Adjust for optimum focus using the focus ring. (See Fig. 7-47.)

7-4-4. Aberration Adjustment

Mode	E-E
Signal	Dot pattern
Specified Value	See Fig. 7-49.

Adjustment method:

1) Use the aberration adjustment rings to adjust any trailing dots to within 2 times the dot diameter and any fan shaped aberrations to within the dot diameter.
2) If off center, repeat the Centering Adjustment.

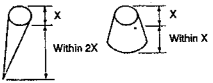


Fig. 7-49.

7-4-5. Horizontal Oscillation Frequency Adjustment (VF-14 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-4NSP)
Measurement Point	Positive terminal of C954
Measuring Instrument	Digital voltmeter or oscilloscope (DC range)
Adjusting Element	RV951
Specified Value	2.60 ± 0.05 Vdc

Adjustment method:

1) Adjust to 2.60 ± 0.05 Vdc using RV901.

7-4-6. Horizontal Amplitude Adjustment (VF-19 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-4NSP) Monoscope portion
Adjusting Element	C961
Specified Value	6 ± 3%

Adjustment method:

1) Line up the upper and lower sections of the monoscope image with the upper and lower edges of the screen by rotating RV952.
2) Rotate RV954 to set the brightness to the normal level.
3) Short or open the pattern (A) of the H size adjustment capacitor (C961) to provide horizontal overscans of 6 ± 3% (total of left and right). (See Fig. 7-51.)

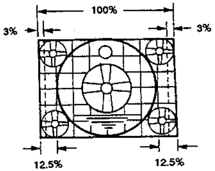
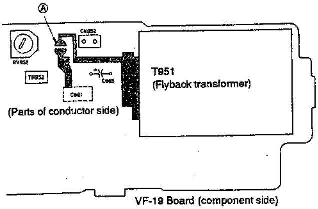


Fig. 7-50.



A section	H size
Open	Large
Short	Small

Fig. 7-51.

7-4-7. Vertical Amplitude Adjustment (VF-19 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-4NSP) Monoscope portion
Adjusting Element	RV952
Specified Value	5 ± 2%

Adjustment method:

1) By turning RV952, adjust vertical overscan to 5 ± 2%. (upper and lower total)

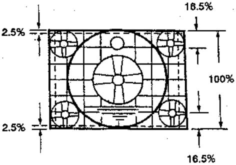


Fig. 7-52.

7-4-8. Brightness, Contrast Adjustments (VF-19 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-4NSP) Monoscope portion
Adjusting Element	Brightness: RV954 Contrast: RV953

Adjustment method:

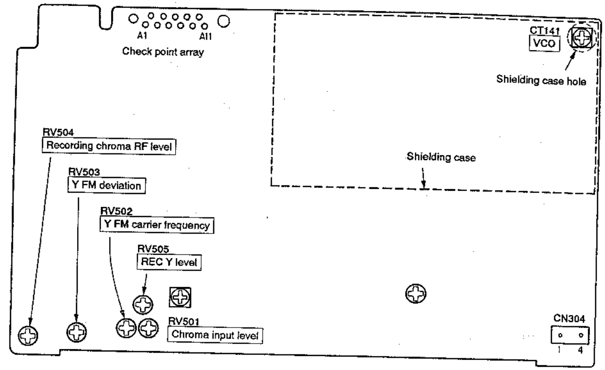
1) Rotate RV954 and RV953 alternately until the bright and dark areas of a gray scale are displayed correctly. (The bright areas should not be made too bright to avoid a fuzzy display of the cross-hatches in the monoscope circle, and the brightness of the dark areas should be such that discrimination between the darkest and second darkest area is possible.)

7-4-9. Horizontal Amplitude, Vertical Amplitude and Focus Checks

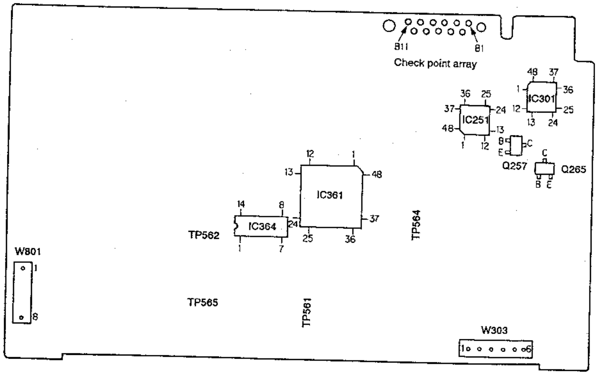
Values should conform to specifications given in 7-4-6. Horizontal Amplitude Adjustment and 7-4-7. Vertical Amplitude Adjustment. If not, readjust accordingly, and repeat 7-4-8. Brightness, Contrast Adjustments. In this case, focus needs to be checked. If the image is not clear, perform 7-4-3. Focus Adjustment and 7-4-4. Aberration Adjustment.

7-5. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

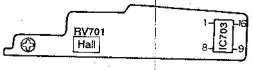
VC-60 BOARD (COMPONENT SIDE)


A1
A11
Check point array
CT141
VCO
Shielding case hole
RV504
Recording chroma RF level
RV503
Y FM deviation
RV502
Y FM carrier frequency
RV505
REC Y level
RV501
Chroma input level
Shielding case
CN304
1
4

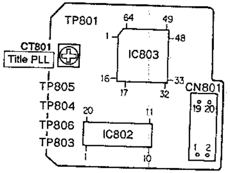
VC-60 BOARD (CONDUCTOR SIDE)


B11
B1
Check point array
IC301
IC251
IC361
IC364
Q257
Q265
TP562
TP564
TP565
TP561
W801
W303

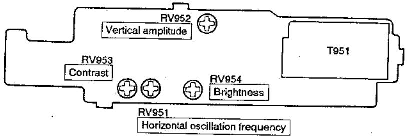
LD-11 BOARD (COMPONENT SIDE)


RV701
Hall
IC703

TI-15 BOARD (COMPONEVT SIDE)


TP801
CT801
Title PLL
IC803
TP805
TP804
TP806
TP803
IC802
CN801

VF-19 BOARD (COMPONENT SIDE)


RV952
Vertical amplitude
T951
RV953
Contrast
RV954
Brightness
RV951
Horizontal oscillation frequency

SECTION 8
MECHANICAL ADJUSTMENT

MECHANICAL ADJUSTMENT

As to the mechanical adjustment and check and parts replacement, refer to the separate "8 mm Video Mechanical Adjustment Guide II FL mechanism (Q mechanism)".
However, follow these items shown below.

8-1. OPERATING WITH THE CASSETTE COMPARTMENT ASSEMBLY REMOVED (See Fig. 8-1.)

1. Loading

1) Remove the cabinets and camera block according to the section 2. DISASSEMBLY, and supply the power to the unit. (Set up the mechanism deck so as to operate.)
2) Push into the lock plate release arm ❶ in the direction of arrow, causing the unit to be the loading state.

2. Putting into the playback state

1) Short circuit Pins ③ and ⑧ of CN204 on the VS-22 board to set to the TEST mode.
(In the TEST mode, the rotation detecting, etc. of the S and T reel tables is ceased. This enables the tape traveling.)
2) After completing the step 1), set the power switch to VTR.
3) Put the cap ❸ on the LED assembly ❷.
4) Push into the lock plate release arm ① to load.
5) Press the playback button.

3. Putting into the recording state

1) Perform the step 1) through 4) of 2. Putting into the playback state.
2) Secure the push switch ❹ with an adhesive tape ❺.
3) Turn on the REC switch.

4. Ejecting

1) Push the EJECT button.

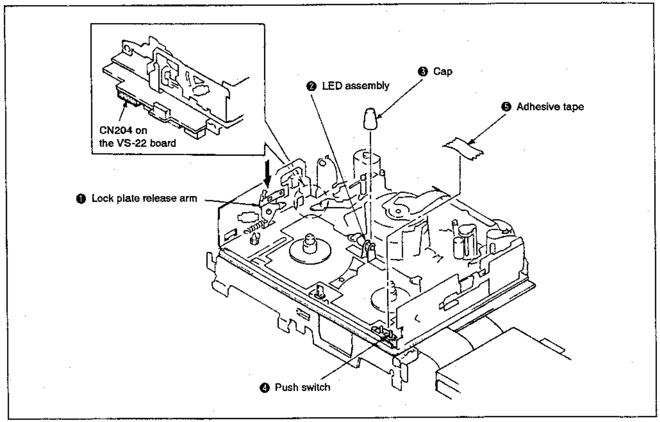


Fig. 8-1.

8-2. TAPE PATH ADJUSTMENT

1. Preparations

1) Clean the tape pass surface(tape guide, drum, capstan shaft and pinch roller).
2) Short circuit Pins ③ and ⑦ of CN204 on the VS-22 board to set to the PATH mode.
3) Connect to an oscilloscope.
   Channel 1 — Pin ① of CN204 on the VS-22 board
   External trigger — Pin ④ of CN204 on the VS-22 board
4) Play back the tracking alignment tape (WR5-1N).
5) Confirm that the RF waveforms at both sides of the entrance and exit on the oscilloscope are flat.
   If not, perform adjustment according to the following.

CN204 on the VS-22 board

1	PB RF CH1
2	PB RF CH2
3	PB RF GND
4	RF SWP
5	UN(1/2 RF SWP)
6	UN(REC C CHECK)
7	UN(PATH)
8	UN(TEST)
9	UN(CAM ADJ)
10	UN(SP)/LP
11	DRUM I COM
12	CAP FG

SECTION 9

VIDEO BLOCK ADJUSTMENTS

During the adjustments, see the arrangement diagram for adjustment parts from page 302.

9-1. PRE-ADJUSTMENT PREPARATIONS (VIDEO BLOCK)

Use the following measuring instruments for adjustment of the VTR block.

9-1-1. Equipment to be Used

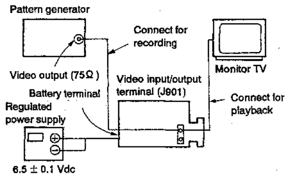
1) Monitor TV
2) Dual trace oscilloscope of over 10 MHz band, incorporates delay mode. (Use 10 : 1 probe unless otherwise specified)
3) Frequency counter
4) Pattern generator with video output terminal
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuator
10) Regulated power supply
11) Alignment tapes
    Tracking adjustment (WR5-1N)
        Parts Code: 8-966-995-01
    Video frequency characteristics adjustment (WR5-6N)*1
        Parts Code: 8-966-995-12
    Operation check (WR5-4NL)*2
        Parts Code: 8-966-995-51
        (WR5-4NSP)*3
        Parts Code: 8-966-995-41

    Note:
    *1 WR5-2N (8-966-995-11) is also available.
    *2 WR5-3NL (8-966-995-31) is also available.
    *3 WR5-3NSP (8-966-995-22) is also available.
12) Adjustment remote commander (Modification of RM-95)

9-1-2. Connection of Equipment

Unless otherwise specified, adjustment is made with the measuring instrument connected as shown in the Fig. 9-1. below.

- Camera/video power switch ······· Video position
- Input/output selector switch ······· Input position (REC mode)
  Output position (PB mode)
- Connect the adjustment remote commander to the remote terminal (J902 on the EL-1 board)when performing system control adjustment and servo system adjustment.



When connecting the pattern generator and the monitor TV at the same time, set the input/output selector switch to the input position and connect the pattern generator to the video input/output terminal. For the connection of the monitor TV refer to the diagram below.

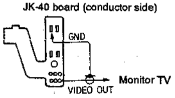


Fig. 9-1.

9-1-3. Set-up During Adjustment

Since the video output signal obtained from the pattern generator is used as the adjusting signal for the VTR block electrical adjustment, it is necessary that this video output signal be within the required specifications. Connect an oscilloscope to the video input/output terminal of the JK-40 board and make sure that the amplitude of the video SYNC signal is approximately 0.3V, that the video block amplitude is approximately 0.7V, that the burst signal amplitude is approximately 0.3V with flat characteristics, and the signal level ratio between the burst signal and "Red" signal is 0.30 : 0.66. The video signal (color bars) used for VTR block electrical adjustment are shown in Fig. 9-2.

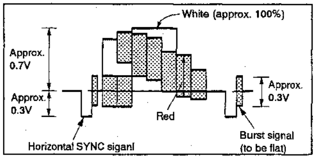
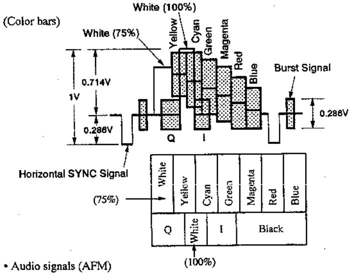


Fig. 9-2. Color bar signal of pattern generator

9-1-4. Alignment Tapes

Tape	Content	Use
Tracking (WR5-1N)	1. Recording area: PCM – video 2. Recording content: CH2: 1 MHz linearity adjustment signal (CH1: 9 MHz)	Drum linearity adjustment
Video Frequency Response (WR5-6N)	1. Recording area: Video 2. Recording content: RF sweep 0 to 10 MHz 3. Maker: 1, 3.58, 5.5 and 7 MHz	Frequency response adjustment
Operation Check SP mode (WR5-4NSP) LP mode (WR5-4NL) Note: PCM area is not included in WR5-4NL	1. Recording area: Video 2. Recording content: ■ Video area • Video signals Color bars 4 minutes Monoscope 4 minutes (Color bars)  White (100%) White (75%) Yellow Cyan Green Magenta Red Blue Burst Signal 0.714V 1V 0.286V Q I 0.286V Horizontal SYNC Signal (75%) White Yellow Cyan Green Magenta Red Blue Q White I Black (100%) • Audio signals (AFM) 400 Hz 60% modulation ■ PCM area • Audio signals (PCM) 1 kHz 4 minutes Color bar 20 Hz 20 sec 400 Hz 20 sec 14 kHz 20 sec } Iterative Monoscope	Operation check

9-1-5. I/O Level and Impedance

Video input	Pin jack Input signal: 1 Vp-p, 75 Ω unbalanced, negative sync
Video output	Pin jack Output signal: 1 Vp-p, 75 Ω unbalanced, negative sync
Audio input	Pin jack Input level: –7.5 dBs (0 dBs=0.775 Vrms) Input impedance: More than 47 kΩ
Audio output	Pin jack Specified output: –7.5 dBs Output impedance: 2.2 kΩ or less

9-1-6. Service Modes

This unit is equipped with service modes for adjustment and operation checking.
There are the following two service modes and switching between them is by connection between GND and Pin (B6) of the check point array CPA001on the VC-60 board.

Service Mode	Function	Connection between GND and Pin (B6) of the check point array
Status indication mode	For video block adjustment, operation checking	Open (no connection)
EVR adjustment mode	For adjustment of camera block	Shorted

Refer to Camera Block Adjustment for details on the EVR adjustment mode.

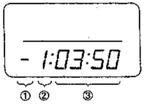
1. Invoking service mode

1) Connect the adjustment remote commander to the remote terminal (J902 on EL-1 board) of the main unit.
2) Set the HOLD switch of the adjustment remote commander to the HOLD position (SERVICE position).

The status indication mode is invoked by the above operation. (To select the EVR adjustment mode, connection between Pin (B6) of the check point array CPA001 and GND is required.)

2. Indication on adjustment remote commander LCD in status indication mode

Note: In categories 1 through 5, the same information is displayed in the EVF screen.



①...... Minus segment flashes to indicate that the service mode has been invoked.
②...... Indicates service mode category.
③...... Indicates battery voltage, LAST EMG, PRESET EMG, or MODE SW CODE. or DEW MODE according to current category.

3. Category selection and indication in each category

Select the desired category with the [FF] button of the adjustment remote commander. There are five categories (1 through 5) and the indications are different for each. (Note that category 0 is the EVR adjustment mode.)

Caategory	Indication on LCD
1	A/D conversion value for battery voltage (decimal indication)[1] 00 : 00 – 02 : 55
2	LAST EMG (last emergency)[2] Refer to Service Mode Error Indications.
3	PRESENT EMG (current emergency)[3] Refer to Service Mode Error Indications.
4	MODE SW CODE (mechanism status) 00 : 01 READY 00 : 02 GL 00 : 03 USE 00 : 04 EJECT 00 : 05 RP(REC, PB, FF, REW. CUE, REVIEW, PAUSE) 00 : 06 LS 00 : 07 BL
5	DEW MODE 00:00 NORMAL 00:01 SENSOR ON DEW MODE (sensor in DEW mode) 00:02 SENSOR OFF DEW MODE (Restart of operation is possible after the following conditions have been satisfied: 1. EJECT 2. More than 1H has elapsed.)

Notes: 1) Indicates a value proportional to the battery voltage.
2) LAST EMG indicates the error occurring last before entering service mode. Even if an error occurs in the service mode, it is not indicated.
3) PRESENT EMG indicates the status when the [FF] button of the adjustment remote commander was pressed. So, the indication does not change even if the error is eliminated.

- **Service mode error indication**

Error Status	PRESENT EMG Indication	LAST EMG Indication
No error	00 : 00	00 : 00
Loading motor	00 : 01	00 : 01
REEL FG error during unthreading	00 : 02	00 : 02
REEL FG error not during unthreading	00 : 03	00 : 03
Capstan error	00 : 04	00 : 04
DRUM PG error (0) when starting drum	00 : 05	00 : 05
DRUM PG error (1) when starting drum	01 : 05	00 : 14
DRUM PG error (2) when starting drum	02 : 05	00 : 15
No DRUM PG (0) when starting drum	00 : 06	00 : 06
No DRUM PG (1) when starting drum	01 : 06	00 : 14
No DRUM PG (2) when starting drum	02 : 06	00 : 15
DRUM FG error (0) when drum stationary	00 : 07	00 : 07
DRUM FG error (1) when drum stationary	01 : 07	00 : 14
DRUM FG error (2) when drum stationary	02 : 07	00 : 15
No DRUM PG (0) when drum stationary	00 : 08	00 : 08
No DRUM PG (1) when drum stationary	01 : 08	00 : 14
No DRUM PG (2) when drum stationary	02 : 08	00 : 15
Phase error (0) when drum stationary	00 : 09	00 : 09

(1) During tape threading
(2) During tape unthreading
(0) Other

4. Releasing service mode

The service mode is released by returning the HOLD switch of the adjustment remote controller to the NORMAL position or by disconnecting the adjustment remote controller from the remote terminal.

9-2. POWER SUPPLY BLOCK CHECKS

9-2-1. Power Supply Check (VS-22 Board)

Measuring Instrument	Digital voltmeter
VIDEO 5V	
Measurement Point	Pin ② of W605
Specified Value	$4.90^{+0.1}_{-0.07}$ V
REG 5V	
Measurement Point	Pin ③ of W605
Specified Value	4.85 ± 0.1V
EVF 5V	
Measurement Point	Pin ① of W604
Specified Value	4.96 ± 0.05V
EVER 5V	
Measurement Point	Pin ② of W604
Specified Value	$5^{+0.2}_{-0.25}$ V

Checking method:

1) Each power supply voltage should satisfy the corresponding specified value.

9-3. SYSTEM CONTROL ADJUSTMENTS

9-3-1. Battery Down Adjustment (DC/DC Converter Unit)

Mode	Recording
Signal	Arbitrary
Measurement Point	Confirmation on monitor screen
Measuring Instrument	
Adjusting Element	RV551
Specified Value	–1 : 01 : 46

Connections:
1) Connect a regulated power supply and digital voltmeter as shown in Fig. 9-3.
2) Connect Pin ⑧ (TEST) and Pin ③ (PB RF GND) of CN204 with a jumper wire. (TEST mode)

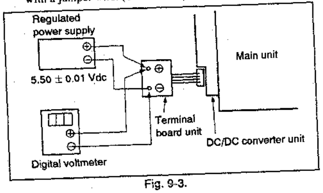

Regulated power supply
5.50 ± 0.01 Vdc
Main unit
Terminal board unit
DC/DC converter unit
Digital voltmeter

Fig. 9-3.

Adjustment method:
1) Connect the adjustment remote commander to the remote terminal (J902 on EL-1 board).
2) Set the power switch (S901) on the FK-9 board to the camera position.
3) Set the HOLD switch on the adjustment remote commander to the HOLD position (service position).
4) Confirm that the indication on the digital voltmeter is 5.50 ± 0.01 Vdc.
5) Set the LCD counter indication on the adjustment remote commander to " – 1:01:46" using the DC/DC converter unit VR (refer to Fig. 9-4.).

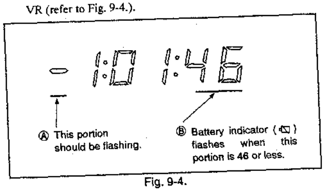

- 1:01 1:46
Ⓐ This portion should be flashing.
Ⓑ Battery indicator (🔋) flashes when this portion is 46 or less.

Fig. 9-4.

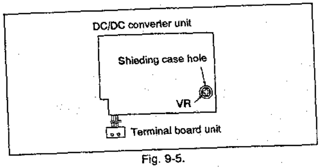

DC/DC converter unit
Shieding case hole
VR
Terminal board unit

Fig. 9-5.

Checking method:
Perform the following checks and repeat the adjustments again if the required conditions are not satisfied.
1) Adjust the output voltage of the regulated power supply so that the digital voltmeter indication becomes 5.65 ± 0.01 Vdc. (VTR in camera recording mode)
2) Confirm that the 🔋 mark is not lit on the EVF (viewfinder) screen (TALLY lamp is lit).
3) Lower the output voltage of the regulated power supply so that the digital voltmeter indication becomes 5.53 ± 0.01 Vdc.
4) Confirm that the 🔋 mark and the TALLY lamp are flashingin approx. 1 sec. intervals on the EVF screen.
5) Lower the output voltage of the regulated power supply so that the digital voltmeter indication becomes 5.47 ± 0.01 Vdc.
6) Confirm that the flashing of the 🔋 mark and the TALLY lamp on the EVF screen becomes faster, and that the VTR stops and the power is turned off.

9-3-2. System Clock Adjustment (VC-60 Board)

Note: Perform the adjustment with the lens removed.

Mode	Power ON
Measurement Point	TP562 (Pin (59) of IC561)
Measuring Instrument	Frequency counter
Adjusting Element	RV561
Specified Value	330 ± 5 kHz

Adjustment method:
1) Adjust with RV561 so that it becomes 330 ± 5 kHz.

9-3-3. Clock Precision Adjustment (VC-60 Board)

Note: Perform the adjustment with the lens and the LCD (CN806) removed.

Mode	Power OFF
Measurement Point	TP561 (Pin (54) of IC561)
Measuring Instrument	Frequency Counter
Adjusting Element	CT561
Specified Value	512.000 ± 0.003 Hz

Adjustment method:

1) Turn off the power.
2) Connect TP564 ($\overline{\text{TEST}}$) and TP565 (GND) using a jumper wire. (TEST mode)
3) Turn on the power.
4) Adjust to 512.000 ± 0.003 Hz with CT561.
5) Remove the jumper wire.
6) When performing this adjustment, be sure not to connect the LCD.

TP561 measuring waveform

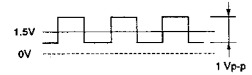


Fig. 9-6.

9-4. SERVO SYSTEM ADJUSTMENTS

9-4-1. Capstan FG Frequency Check (VS-22 Board)

Mode	Recording (SP/LP)
Signal	Arbitrary
Measurement Point	Pin ⑫ (CAP FG) of CN204
Measuring Instrument	Frequency counter
Specified Value	SP mode:819.7 ± 2 Hz LP mode:410 ± 2 Hz

Checking method:

1) Connect Pin ⑧ (UN (TEST)) and Pin ③ (PB RF GND) of CN204 using a jumper wire. (TEST mode)
2) Set the edit switch on the CF-4 board to ON.
(Confirm that "SP" is indicated on the adjustment remote commander.)
3) Set to recording mode and confirm that the capstan FG frequency is 819.7 ± 2 Hz.
4) Set to stop mode and turn OFF the edit switch. (Confirm that "LP" is indicated on the adjustment remote commander.)
5) Set to recording mode and confirm that the capstan FG frequency is 410 ± 2 Hz.
6) Remove the jumper wire connected in step 1).

9-4-2. Capstan FG Offset Adjustment (VS-22 Board)

Mode	Recording
Signal	Arbitrary
Measurement Point	Pin ⑫ (CAP FG) of CN204
Measuring Instrument	Oscilloscope
Adjusting Element	RV502
Specified Value	50% duty cycle

Adjustment method:

1) Connect Pin ⑧ (UN (TEST)) and Pin ③ (PB RF GND) of CN204 using a jumper wire. (TEST mode)
2) Set the edit switch on the CF-4 board to ON.
(Confirm that "SP" is indicated on the adjustment remote commander.)
3) Set the CAP FG output waveform duty cycle to 50% using RV502.
4) Remove the jumper wire connected in step 1) and turn OFF the edit switch.

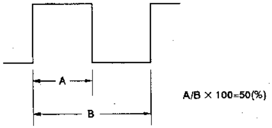


Fig. 9-7. Capstan FG offset adjustment

9-4-3. Drum Driver MMW Adjustment (VS-22 Board)

Mode	Recording
Signal	Arbitrary
Measurement Point	Pin ⑪ (DRUM 1 COM) of CN204
Measuring Instrument	Oscilloscope
Adjusting Element	RV501
Specified Value	Minimum amplitude

Connection:

1) Connect the oscilloscope by inserting the filter as shown in the diagram below.

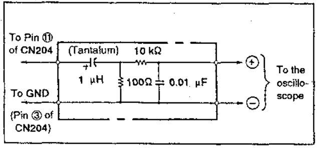

To Pin ⑪
of CN204
(Tantalum)
10 kΩ
1 μH
100Ω
0.01 μF
To GND
(Pin ③ of
CN204)
+
−
To the
oscillo-
scope

Fig. 9-8.

Adjustment method:

1) Minimize the output waveform amplitude by adjusting RV501.

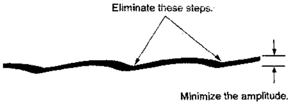

Eliminate these steps.
Minimize the amplitude.

Fig. 9-9. Drum driver MMW adjustment

9-4-4. Drum Phase Lock Check (VS-22 Board)

Mode	Recording
Signal	Arbitrary
Measurement Point	CH-1: Pin ⑪ (SYSTEM SYNC) of IC601 CH-2: Pin ④ (RF SWP) of CN204
Measuring Instrument	Oscilloscope
Specified Value	224 ± 50 μsec

Checking method:

1) Connect Pin ⑧ (UN (TEST)) and Pin ③ (PB RF GND) of CN204 using a jumper wire. (TEST mode)
2) Set the edit switch on the CF-4 board to ON.
   (Confirm that "SP" is indicated on the adjustment remote commander.)
3) Set to recording mode.
4) Confirm that duration between the switching point of CH-2 (RF SWP) and the rising edge of CH-1 (SYSTEM SYNC) is 224 ± 50 μsec.

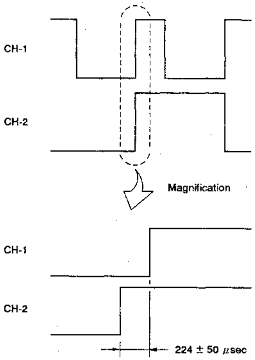

CH-1
CH-2
Magnification
CH-1
CH-2
224 ± 50 μsec

Fig. 9-10. Drum phase lock check

9-4-5. Switching Position Adjustment (VS-22 Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-4NSP)
Measurement Point	CH-1: Video input/output terminal CH-2: Pin ④ (RF SWP) of CN204
Measuring Instrument	Oscilloscope
Adjusting Element	RV602
Specified Value	6.5 ± 0.3H (410 ± 20 μsec)

Adjustment method:

1) Adjust to 6.5 ± 0.3H (410 ± 20 μsec) using RV602.

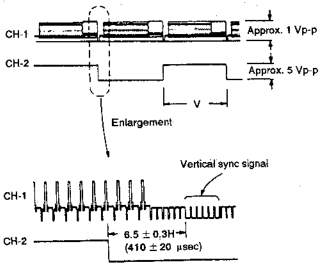


Fig. 9-11. Switching position adjustment

9-5. VIDEO BLOCK ADJUSTMENT

The adjustment of the video system should in principle follow the adjustment procedure outlined below.

The color video signal supplied from the pattern generator is utilized as the video input signal for video system adjustment in the recording mode. Make sure that the sync signal and color burst signal match the specifications given in set-up for adjustment, as shown in Fig. 9-2.

[Adjustment procedure]

1) Playback frequency characteristics adjustment
2) Flying erase check
3) Crystal oscillator fo adjustment
4) Y/C separation adjustment
5) IR2 adjustment
6) SYNC AGC adjustment
7) Emphasis input level adjustment
8) PB Y level 1 adjustment
9) PB Y level 2 adjustment
10) Y FM carrier frequency adjustment
11) Y FM deviation adjustment
12) Chroma emphasis fo adjustment
13) REC C RF level adjustment
14) REC Y level adjustment
15) REC C preset adjustment
16) REC ATF level adjustment
17) Chroma flicker adjustment

9-5-1. Playback Frequency Characteristics Adjustment (VS-22 Board)

Mode	Playback
Signal	Alignment tape: For frequency characteristics adjustment (WR5-6N)
Measurement Point	See Fig. 6-12a.
Measuring Instrument	Oscilloscope
Adjusting Element	RV111 (1a) RV113 (1b) RV112 (2a) RV114 (2b)
Specified Value	3.58 MHz level : 5.5 MHz level= 4 : 3 ± 0.3

Adjustment method:

1) Adjust each RV so that the ratio of the 3.58 MHz level to the 5.5 MHz level of the PB RF output waveform becomes 4:3 ± 0.3 for 1a, 1b, 2a, and 2b respectively.

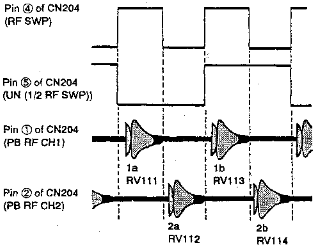

Pin ④ of CN204
(RF SWP)
Pin ⑤ of CN204
(UN (1/2 RF SWP))
Pin ① of CN204
(PB RF CH1)
1a
RV111
1b
RV113
Pin ② of CN204
(PB RF CH2)
2a
RV112
2b
RV114

Fig. 9-12a. Playback frequency characteristics adjustment

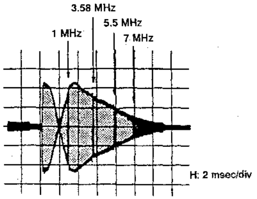

3.58 MHz
5.5 MHz
1 MHz
7 MHz
H: 2 msec/div

Fig. 9-12b. Playback frequency characteristics adjustment

9-5-2. Flying Erase Check (VS-22 Board)

Mode	Recording
Signal	Arbitrary
Measurement Point	Pin ⑮ of CN101 (FE (X))
Measuring Instrument	Oscilloscope and frequency counter
Specified Value	Frequency: Over 7.0 MHz Voltage: Over 6.0 Vp-p

Note: Be sure to use MP type tape. (Pin ⑫ of CN602 should be "L".)

Checking method:

1) Confirm that the oscillation frequency is over 7.0 MHz and the oscillation voltage is over 6.0 Vp-p.

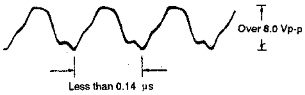

Over 6.0 Vp-p
Less than 0.14 μs

Fig. 9-13. Flying erase check

9-5-3. Crystal Oscillator fo Checking (VS-22 Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-4NSP)
Measurement Point	Pin ⑯ of IC203
Measuring Instrument	Frequency counter
Specified Value	3579545 ± 70 Hz

Note: Connect the frequency counter through a buffer having high impedance (approx. 10 MΩ) and low capacitance (less than 10 pF).

Checking method:

1) Confirm that the oscillation frequency at Pin ⑥ of IC203 is 3579545 ± 70 Hz.

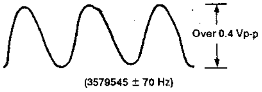

Over 0.4 Vp-p
(3579545 ± 70 Hz)

Fig. 9-14. Crystal oscillator fo adjustment

9-5-4. Y/C Separation Adjustment (VS-22 Board)

Mode	Recording
Signal	Color bars
Measurement Point	Any terminal of RV204 (DEV) (Pin ㉕ of IC203)
Measuring Instrument	Oscilloscope
Adjusting Element	RV207
Specified Value	Minimum residual chroma component

Connections:

1) Connect Pin ㊴ of IC203 to GND (Pin (58) or (68) of IC203) with a 10 μF/16V electrolytic capacitor. (Capacitor negative side to GND)

Adjustment method:

1) Set the residual chroma component to minimum with RV207.

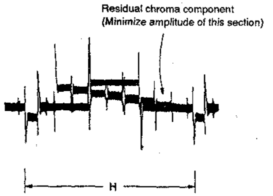


Fig. 9-15. Y/C separation adjustment

9-5-5. IR2 Adjustment (VS-22 Board)

Mode	Recording
Signal	Color bars
Measurement Point	Pin ⑧ of IC203 or base of Q229 (BF OUT)
Measuring Instrument	Oscilloscope
Adjusting Element	RV206
Specified Value	6.9 ± 0.2 μsec

Adjustment method:

1) Adjust so that the time between the rising edge and falling edge of the pulse becomes 6.9 ± 0.2 μsec.

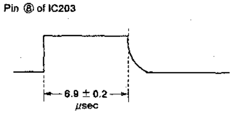


Fig. 9-16. IR2 adjustment

9-5-6. SYNC AGC Adjustment (VS-22 Board)

Mode	Recording
Signal	Color bar
Measurement Point	Pin ㊾ of IC203
Measuring Instrument	Oscilloscope
Adjusting Element	RV201
Specified Value	0.50 ± 0.025 Vp-p

Adjustment method:

1) Adjust with RV201 so that it becomes 0.50 ± 0.025 Vp-p.

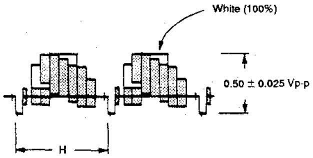


Fig. 9-17. SYNC AGC adjustment

9-5-7. Emphasis Input Level Adjustment (VS-22 Board)

Mode	Recording
Signal	Color bar
Measurement Point	Pin (54) of IC203
Measuring Instrument	Oscilloscope
Adjusting Element	RV205
Specified Value	0.50 ± 0.025 Vp-p

Adjustment method:

1) Adjust with RV205 so that it becomes 0.50 ± 0.025 Vp-p.
2) Be sure to perform "PB Y Level Adjustment" after "Emphasis Input Level Adjustment".

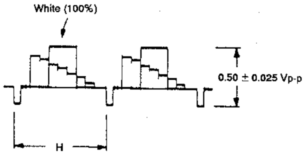


Fig. 9-18. Emphasis input level adjustment

9-5-8. PB Y Level 1 Adjustment (VS-22 Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-4NSP) color bar section
Measurement Point	Pin ㊼ of IC203
Measuring Instrument	Oscilloscope
Adjusting Element	RV202
Specified Value	0.50 ± 0.02 Vp-p

Note: Terminate the video input/output terminal (J901) at 75Ω.

Adjustment method:

1) Adjust to 0.50 ± 0.02 Vp-p using RV202.
2) Be sure to perform "PB Y Level 2 Adjustment" after "PB Y Level 1 Adjustment".

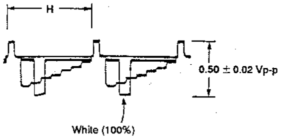


Fig. 9-19. PB Y level 1 adjustment

9-5-9. PB Y Level 2 Adjustment (VS-22 Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-4NSP) Color bar section
Measurement Point	J201 (VIDEO OUT)
Measuring Instrument	Oscilloscope
Adjusting Element	RV208
Specified Value	1.00 ± 0.05 Vp-p

Note: 1) Terminate VIDEO OUT (J901) at 75Ω.
2) Make sure that "PB Y Level 1 Adjustment" has been completed.
3) Make sure that "Emphasis Input Level Adjustment" has been completed.

Adjustment method:
1) Adjust with RV208 so that it becomes 1.00 ± 0.05 Vp-p.

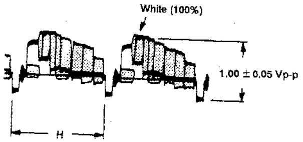


Fig. 9-20. PB Y level 1 adjustment

9-5-10. Y FM Carrier Frequency Adjustment (VS-22 Board)

Mode	Recording
Signal	No signal
Measurement Point	TP161
Measuring Instrument	Frequency counter
Adjusting Element	RV204
Specified Value	4.38 ± 0.04 MHz

Adjustment method:
1) Adjust to 4.38 ± 0.04 MHz with RV204.
2) Perform "Deviation Adjustment".

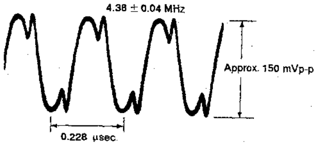


Fig. 9-21. Y FM carrier frequency adjustment

9-5-11. Y FM Deviation Adjustment (VS-22 Board)

Mode	Recording and playback
Signal	Color bar
Measurement Point	Video input/output terminal
Measuring Instrument	Oscilloscope
Adjusting Element	RV203
Specified Value	Playback level is 1.00 ± 0.05 Vp-p

Notes: 1) Confirm that "Emphasis Input Level Adjustment", "PB Y Level Adjustment" and "Y FM Carrier Frequency Adjustment" have been completed.
2) Terminate Video input/output terminal (J901) at 75Ω.

Adjustment method:
1) Record the color bar signal.
2) Playback the recorded signal.
3) Confirm the playback output.
Specified value: 1.00 ± 0.05 Vp-p
4) If the specified value is not satisfied, repeat 1) to 3) after turning RV203 in the following manner.

	Rotation direction of RV203
When smaller than specified value	Clockwise (↻)
When larger than specified value	Counterclockwise (↺)

Table 9-1.

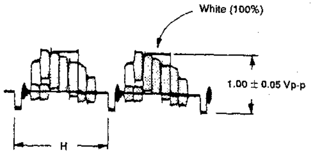


Fig. 9-22. Y FM deviation adjustment

9-5-12. Chroma Emphasis fo Adjustment (VS-22 Board)

Mode	Recording
Signal	Color bar
Measurement Point	TP212
Measuring Instrument	Oscilloscope
Adjusting Element	FL201
Specified Value	Minimum fo component

Adjustment method:

1) Adjust with FL201 so that amplitude of the flat section of the chroma signal RED section becomes minimum.

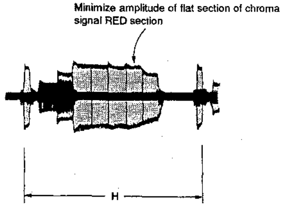

Minimize amplitude of flat section of chroma signal RED section
H

Fig. 9-23. Chroma emphasis fo adjustment

9-5-13. REC C RF Level Adjustment (VS-22 Board)

Mode	Recording
Signal	Color bar
Measurement Point	TP212
Measuring Instrument	Oscilloscope
Adjusting Element	RV210
Specified Value	240 ± 10 mVp-p

Adjustment method:

1) Adjust RV210 so that the amplitude of the flat section of the chroma signal RED section becomes 240 ± 10 mVp-p.

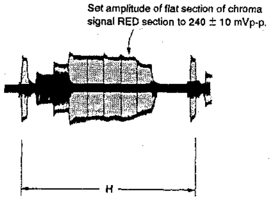

Set amplitude of flat section of chroma signal RED section to 240 ± 10 mVp-p.
H

Fig. 9-24. REC C level adjustment

9-5-14. REC Y Level Adjustment (VS-22 Board)

Mode	Recording
Signal	No signal
Measurement Point	TP161
Measuring Instrument	Oscilloscope
Adjusting Element	RV209
Specified Value	150 ± 5 mVp-p

Adjustment method:

1) Adjust with RV207 so that it becomes 150 ± 5 mVp-p.

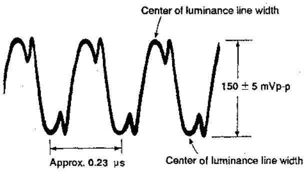

Center of luminance line width
150 ± 5 mVp-p
Approx. 0.23 μs
Center of luminance line width

Fig. 9-25. REC Y Level Adjustment

9-5-15. REC C Preset Adjustment (VS-22 Board)

Mode	Recording
Signal	Color bar
Measurement Point	CH-1 (1:1 probe): TP101 (1a) TP103 (1b) TP102 (2a) TP104 (2b) CH-2 (10:1 probe): Pin ④ (RF SWP) of CN204
Measuring Instrument	Oscilloscope
Adjusting Element	RV101 (1a) RV103 (1b) RV102 (2a) RV104 (2b)
Specified Value	24.0 ± 1.3 mVp-p

Connections:

1) Connect the Q413 base (REC AFM) of the AU-51 board and GND (TP404) via a ceramic capacitor (0.1 μF).
2) Connect the Q543 emitter (REC ATF) and the collector on the VS-22 board using a jumper wire.

Adjustment method:

1) Adjust each RV so that the output waveforms of 1a, 1b, 2a, and 2b become 24.0 ± 1.3 mVp-p.

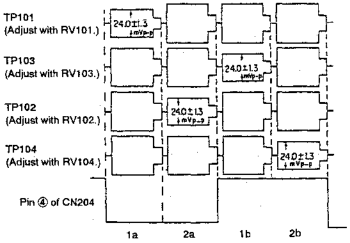

TP101
(Adjust with RV101.)
TP103
(Adjust with RV103.)
TP102
(Adjust with RV102.)
TP104
(Adjust with RV104.)
Pin ④ of CN204
24.0±1.3 mVp-p
24.0±1.3 mVp-p
24.0±1.3 mVp-p
24.0±1.3 mVp-p
1a
2a
1b
2b

Fig. 9-26. REC C preset adjustment

9-5-16. REC ATF Level Check (VS-22 Board)

Mode	Recording
Signal	No signal
Measurement Point	TP101 (1a) TP103 (1b) TP102 (2a) TP104 (2b)
Measuring Instrument	Oscilloscope (1:1 probe)
Specified Value	5.3 ± 1.5 mVp-p (1a) 4.7 ± 1.5 mVp-p (1b) 5.1 ± 1.5 mVp-p (2a) 4.9 ± 1.5 mVp-p (2b)

Connection:

1) Connect the Q413 base (REC AFM) on the AU-51 board and GND (TP404) via a ceramic capacitor (0.1 μF).

Checking method:

1) Trigger a 9.75 μsec (1 cycle) waveform superposed to the output waveform of TP101 (1a), and confirm that the waveform level is 5.3 ± 1.5 mVp-p.
2) Trigger a 6.1 μsec (1 cycle) waveform superposed to the output waveform of TP103 (1b), and confirm that the waveform level is 4.7 ± 1.5 mVp-p.
3) Trigger a 8.4 μsec (1 cycle) waveform superposed to the output waveform of TP102 (2a), and confirm that the waveform level is 5.1 ± 1.5 mVp-p.
4) Trigger a 6.7 μsec (1 cycle) waveform superposed to the output waveform of TP104 (2b), and confirm that the waveform level is 4.9 ± 1.5 mVp-p.

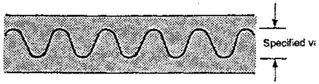

Specified v

Fig. 9-27. REC ATF level check

9-5-17. Chroma Flicker Check and Adjustment (VS-22 Board)

Note: Be sure that "REC C Preset Adjustment", "REC AFM Level Adjustment" and "REC ATF Level Check" have been completed.

Mode	Self recording and playback
Signal	Color bar
Measurement Point	CH-1 (1:1 probe):Pin ③ (PBC RF IN) of IC203 CH-2 (10:1 probe):Pin ④ (RF SWP) of CN204
Measuring Instrument	Oscilloscope
Adjusting Element	RV101 (1a) RV103 (1b) RV102 (2a) RV104 (2b)
Specified Value	$\frac{Vc1a}{Vc1a'} \times 100 = 100^{+12}_{-11}$ (%) $\frac{Vc2a}{Vc2a'} \times 100 = 100^{+12}_{-11}$ (%)

Checking method:

1) Record the color bar signal.
2) Playback the recorded section.
3) Assume the output level of 1a and 2a to be Vc1a and Vc2a, respectively.
4) Connect Pin ⑥ (UN (REC C CHECK)) and Pin ⑧ (PB RF GND) of CN204 using a jumper wire.
5) At this time, assume the output level of 1a and 2a to be Vc1a' and Vc2a', respectively.
6) If the values are not as specified, perform the following adjustment.

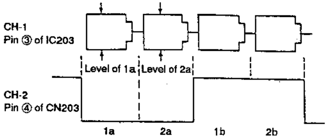


Fig. 9-28.

Adjustment method:

1) If the values were not as specified, calculate the following values from the measured values.

$$\Delta Vc1 = \frac{|Vc1a - Vc1a'|}{2}$$

$$\Delta Vc2 = \frac{|Vc2a - Vc2a'|}{2}$$

Note: | | represents absolute values.

2) The smaller playback level of Vc1a or Vc1a' can be obtained by the following formula.

$$\left\{ \frac{(\text{smaller value of } Vc1a \text{ or } Vc1a') + \Delta Vc1}{(\text{smaller value of } Vc1a \text{ or } Vc1a')} \right\} \times 24\ (\text{mVp-p})$$

The larger playback level of Vc1a or Vc1a' can be obtained by the following formula.

$$\left\{ \frac{(\text{larger value of } Vc1a \text{ or } Vc1a') - \Delta Vc1}{(\text{larger value of } Vc1a \text{ or } Vc1a')} \right\} \times 24\ (\text{mVp-p})$$

The smaller playback level of Vc2a or Vc2a' can be obtained by the following formula.

$$\left\{ \frac{(\text{smaller value of } Vc2a \text{ or } Vc2a') + \Delta Vc2}{(\text{smaller value of } Vc2a \text{ or } Vc2a')} \right\} \times 24\ (\text{mVp-p})$$

The larger playback level of Vc2a or Vc2a' can be obtained by the following formula.

$$\left\{ \frac{(\text{larger value of } Vc2a \text{ or } Vc2a') - \Delta Vc2}{(\text{larger value of } Vc2a \text{ or } Vc2a')} \right\} \times 24\ (\text{mVp-p})$$

3) Perform "REC C Preset Adjustment" using the values calculated for Vc1a, Vc1a', Vc2a and VC2a' in step 2) as specified values for 1a, 1b, 2a, 2b.
4) After adjustment, perform "Chroma Flicker Check" again, and repeat until the specified values are satisfied.

9-5-18. Character Generator f_0 Adjustment (TI-15 Board)

Mode	E-E
Signal	No signal
Measurement Point	TP806 (Pin ⑦ of IC802)
Measuring Instrument	Frequency counter
Adjustment Element	CT802
Specified Value	6.24 ± 0.05 MHz

Adjustment method:

1) Adjust to 6.24 ± 0.05 MHz using CT802.

9-6. AUDIO SYSTEM ADJUSTMENT

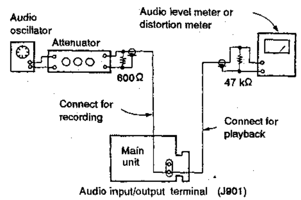
- Perform adjustment with the color bar signal used as the video input signal.

[Connection of audio measuring instruments]

In addition to the video system measuring instruments, connect the audio system measuring instruments as shown in the figure below, and set the power switch to the video position for adjustment.

Set the input/output selector switch according to the mode as follows.

- Input position ···················· Recording mode
- Output position ················ Playback mode


Audio oscillator
Attenuator
Audio level meter or distortion meter
600Ω
47 kΩ
Connect for recording
Connect for playback
Main unit
Audio input/output terminal (J901)

When connecting input and output devices at the same time, set the input/output selector switch to the input position and connect the audio oscillator/attenuator to the audio input/output terminal.

For connection of the audio level meter or distortion meter, refer to the diagram below.

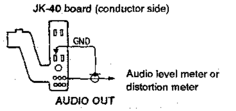

JK-40 board (conductor side)
GND
Audio level meter or distortion meter
AUDIO OUT

Fig. 9-29.

9-6-1. AFM Carrier Frequency Adjustment (AU-51 Board)

Mode	Recording
Signal	Non-signal
Measurement Point	Pin ⑬ of IC401(REC AFM) (JL419)
Measuring Instrument	Frequency counter
Adjusting Element	RV401
Specified Value	1.500 ± 1.002 MHz

Note: Connect the frequency counter through a buffer amplifier (oscilloscope, etc.) having high impedance and low capacitance.

Adjustment method:

1) Turn OFF the audio oscillator output.
2) Adjust the AFM carrier frequency is 1.500 ± 0.002 MHz using RV401.

9-6-2. REC AFM Carrier Level Check (AU-51 Board)

Mode	Recording
Signal	Non-signal
Measurement Point	Pin ⑧ of CN401 (REC AFM)
Measuring Instrument	Oscilloscope
Specified Value	48 ± 8 mVp-p

Checking method:

1) Confirm that the level is 48 ± 8 mVp-p.

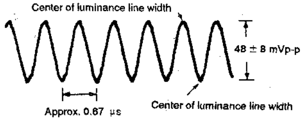

Center of luminance line width
48 ± 8 mVp-p
Approx. 0.67 μs
Center of luminance line width

Fig. 9-30. REC AFM carrier level

9-6-3. AFM Deviation Adjustment (AU-51 Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-3NSP)
Measurement Point	Audio input/output terminal (J901)
Measuring Instrument	Audio level meter
Adjusting Element	RV402
Specified Value	-7.5 ± 0.2 dBs

Checking method:

1) Adjust the audio output level is -7.5 ± 0.2 dBs.

9-6-4. E-E Output Level Check

Mode	E-E
Signal	400 Hz, –7.5 dBs
Measurement Point	TP403
Measuring Instrument	Audio level meter
Specified Value	–7.5 ± 2 dBs

Checking method:

1) Make sure that the audio output level is –7.5 ± 2 dBs.

9-6-5. Overall Level Characteristics Check

Mode	Self-recording and playback
Signal	400 Hz, –7.5 dBs
Measurement Point	Audio input/output terminal (J901)
Measuring Instrument	Audio level meter
Specified Value	–7.5 ± 3 dBs

Checking method:

1) Record the signal.
2) Playback the recorded section.
3) Make sure that the audio output level is –7.5 ± 3 dBs.

9-6-6. Overall Frequency Characteristics Check

Mode	Self-recording and playback
Signal	Ⓐ 400 Hz, –17.5 dBs Ⓑ 30 Hz, –17.5 dBs Ⓒ 14 Hz, –17.5 dBs
Measurement Point	Audio input/output terminal (J901)
Measuring Instrument	Audio level meter
Specified Value	With the 400 Hz playback output level as 0 dB, the playback output level of 30 Hz and 14 kHz is 0 ± 3 dB

Checking method:

1) Record signal Ⓐ through Ⓒ in order.
2) Playback the recorded sections.
3) With the 400 Hz playback output level as 0 dB, confirm that the playback output level of 30 Hz and 14 kHz is 0 ± 3 dB.

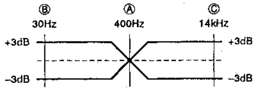


Fig. 9-31. AFM overall frequency characteristics

9-6-7. Overall Distortion Check

Mode	Self recording and playback
Signal	400 Hz, –7.5 dBs
Measurement Point	Audio input/output terminal (J901)
Measuring Instrument	Distortion meter
Specified Value	Less than 0.5% *1

Checking method:

1) Record the signal.
2) Playback the recorded section.
3) Confirm that the distortion is less than 0.5%. *1

*1 Value when 200 Hz – 6 kHz 18dB/oct BPF is used.
When the filter is not used ………… less than 1.0%

9-6-8. Overall Noise Level Check

Mode	Self-recording and playback
Signal	No signal (shorting plug is inserted into audio input jack)
Measurement Point	Audio input terminal (J901)
Measuring Instrument	Audio level meter
Specified Value	Less than – 67.5 dBs*2

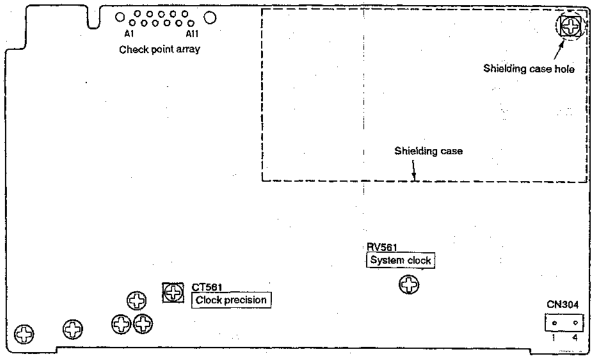
Checking method:

1) Record the signal.
2) Playback the recorded section.
3) Make sure that the noise level is less than –67.5 dBs. *2

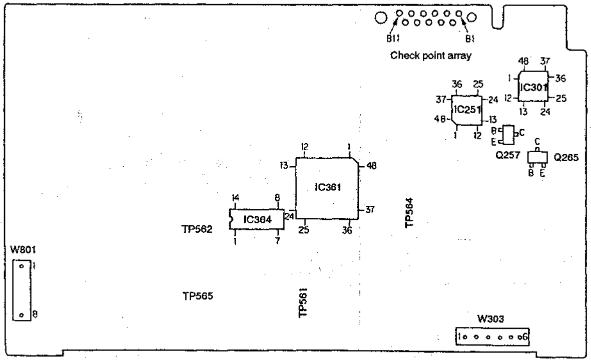
*2 Value when IHF-A hearing correction filter is used.

9-7. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

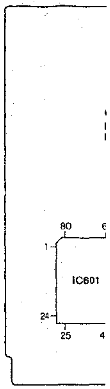
VC-60 BOARD (COMPONENT SIDE)


A1
A11
Check point array
Shielding case hole
Shielding case
RV561
System clock
CT561
Clock precision
CN304
1
4

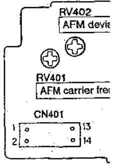
VC-60 BOARD (CONDUCTOR SIDE)


B11
B1
Check point array
48
37
1
36
12
25
13
24
IC301
36
25
37
24
48
13
1
12
IC251
B
C
E
Q257
C
B
E
Q265
12
1
13
48
IC361
37
25
36
14
8
IC364
24
1
7
TP562
TP564
W801
1
8
TP565
TP561
W303
1
6

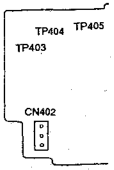
VS-22 BOARD (C


80
1
IC601
24
25
4

AU-51 BOARD (C


RV402
AFM devi
RV401
AFM carrier fre
CN401
1
2
13
14

AU-51 BOARD (C


TP404
TP405
TP403
CN402

d playback

ut terminal (J901)

0.5%.*1
l/oct BPF is used.
.... less than 1.0%

d playback

inserted into audio

inal (J901)

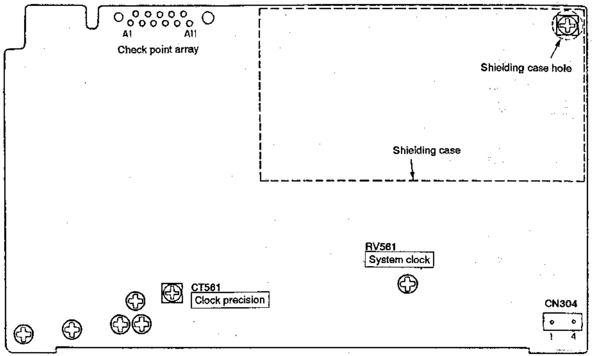
r

dBs*2

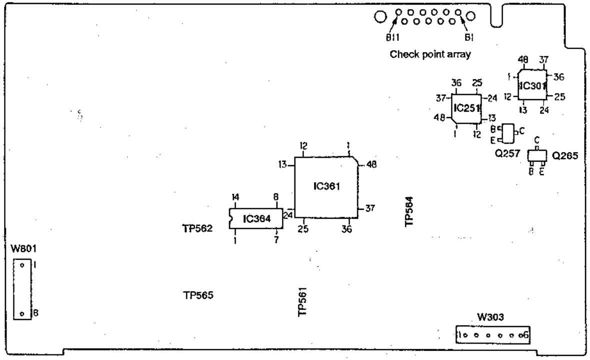
an –67.5 dBs. *2
tion filter is used.

9-7. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

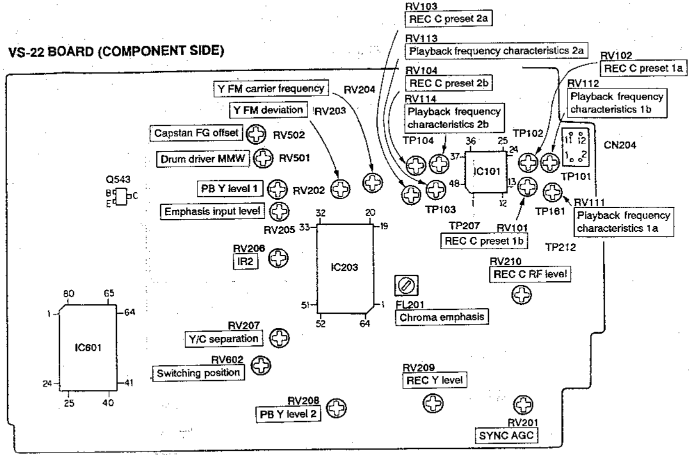
VC-60 BOARD (COMPONENT SIDE)


A1
A11
Check point array
Shielding case hole
Shielding case
RV561
System clock
CT561
Clock precision
CN304
1
4

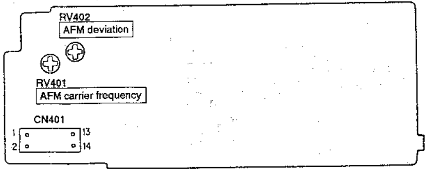
VC-60 BOARD (CONDUCTOR SIDE)


B11
B1
Check point array
48
37
1
IC301
36
12
25
13
24
36
25
37
IC251
24
48
13
1
12
B
C
E
Q257
C
Q265
B
E
12
1
13
48
IC361
37
25
36
14
8
IC364
24
1
7
TP562
TP564
W801
1
8
TP565
TP561
W303
1
6

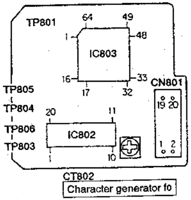
VS-22 BOARD (COMPONENT SIDE)


RV103
REC C preset 2a
RV113
Playback frequency characteristics 2a
RV102
REC C preset 1a
RV104
REC C preset 2b
RV112
Playback frequency characteristics 1b
RV114
Playback frequency characteristics 2b
Y FM carrier frequency
RV204
Y FM deviation
RV203
Capstan FG offset
RV502
Drum driver MMW
RV501
TP104
36
25
TP102
CN204
11
12
1
2
37
24
IC101
TP101
Q543
B
C
E
PB Y level 1
RV202
48
13
Emphasis input level
TP103
1
12
TP161
RV111
Playback frequency characteristics 1a
32
20
RV205
33
19
TP207
RV101
REC C preset 1b
RV206
IR2
IC203
TP212
RV210
REC C RF level
80
65
1
64
51
1
52
64
FL201
Chroma emphasis
IC601
RV207
Y/C separation
RV602
Switching position
24
41
25
40
RV209
REC Y level
RV208
PB Y level 2
RV201
SYNC AGC

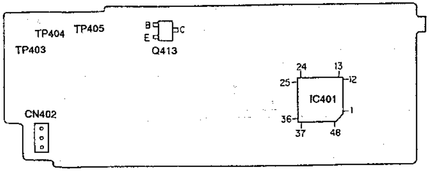
AU-51 BOARD (COMPONENT SIDE)

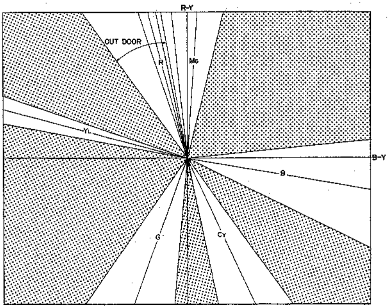

RV402
AFM deviation
RV401
AFM carrier frequency
CN401
1
2
13
14

TI-15 BOARD (COMPONENT SIDE)

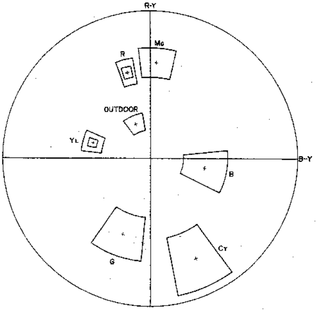

TP801
64
49
1
48
IC803
16
33
17
32
CN801
TP805
TP804
20
11
19
20
TP806
IC802
TP803
1
10
1
2
CT802
Character generator f0

AU-51 BOARD (CONDUCTOR SIDE)


TP404
TP405
B
C
E
TP403
Q413
24
13
25
12
IC401
1
36
37
48
CN402


R-Y
OUT DOOR
R
MG
YL
B-Y
B
G
CY

For Oscilloscope

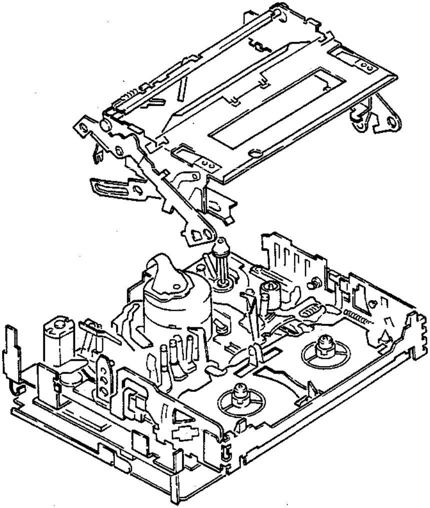

R-Y
MG
R
OUTDOOR
YL
B-Y
B
G
CY

For Vectorscope

8mm Video MECHANICAL ADJUSTMENT MANUAL II

FL MECHANISM (Q MECHANISM) Video 8

File with the SERVICE MANUAL



8 VIDEO RECORDER

SONY®

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1. PREPARATION FOR MECHANICAL CHECK, ADJUSTMENT AND MAINTENANCE

For removal of the cabinet and boards, refer to "Disassembly" in each Service Manual.
Mechanical adjustment is done in the USE mode. (To select the USE mode, refer to "1-4 Handling of Mode Selector".)

1-1 CASSETTE COMPARTMENT HOLDER ASSEMBLY (Fig. 1)

1. Removal

1) Select the USE mode.
2) Remove the screw ①, and then, the LS support ②.
3) Remove the four screws ③, and then, the LS frame assy ④.
4) Remove the three lock washers ⑤, and then, the washer ⑥, bar, joint ⑦, T protector assy ⑧, and TP arm assy ⑨ in that order.
5) Remove the two screws⑩, and then, the two arm shafts A⑪.
6) Remove the shaft through the long hole⑫. With the cassette compartment holder assembly⑬rotated in a direction of the arrowⒶ, remove the long holes⑭and⑮from the shaft in that order, and then, remove the cassette compartment holder assembly⑬.
7) Slide the BS holder⑯in a direction of the arrowⒷas shown in Fig. A and remove it in a direction of the arrowⒸ.

Note : When this is done, be careful not to drop the steel ball and spring, compression out of the BS holder ⑯.

2. Mounting

1) Select the USE mode.
2) Mount the BS holder⑯in the reverse order of its removal. Note: Refer to Fig. A.
3) Mount the shafts in the order of the long holes ⑮, ⑭and⑫ of the cassette compartment holder assembly⑬, respectively.

Note : When this is done, rotate the cassette compartment holder assembly⑬in a direction of the arrowⒶ to mount it until the long hole is aligned with the oval shape of the shaft.

4) Align the oval shape of the two arm shafts A⑪with the long holes of the LS chassis, fit them in firmly and fix with the two screws⑩.
5) Mount the TP arm assy ⑨, T protector assy ⑧ and bar, joint ⑦, respectively. Then, mount the washer ⑥ and three lock washers ⑤.
6) Mount the LS frame assy ④ to the chassis and fix with the four screws ③.
7) Mount the LS support ② to the chassis and fix with the screw ①.

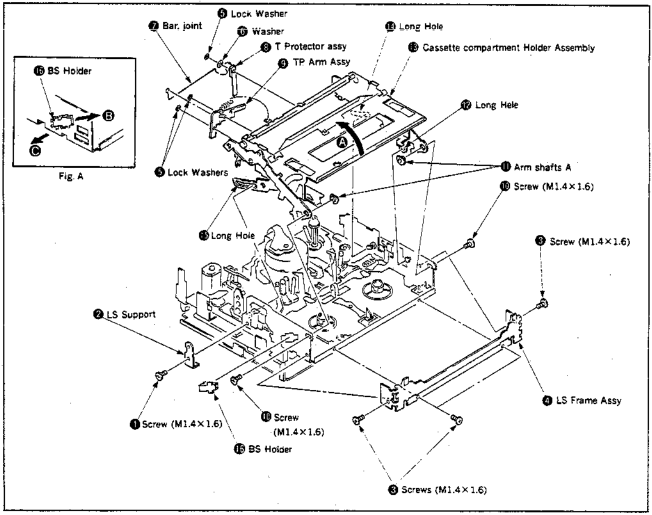

⑤ Lock Washer
⑦ Bar, joint
⑥ Washer
⑧ T Protector assy
⑨ TP Arm Assy
⑭ Long Hole
⑬ Cassette compartment Holder Assembly
⑯ BS Holder
Ⓑ
Ⓒ
⑫ Long Hele
Ⓐ
⑪ Arm shafts A
⑤ Lock Washers
⑩ Screw (M1.4×1.6)
⑮ Long Hole
③ Screw (M1.4×1.6)
② LS Support
④ LS Frame Assy
① Screw (M1.4×1.6)
⑩ Screw (M1.4×1.6)
⑯ BS Holder
③ Screws (M1.4×1.6)

Fig. A

Fig. 1

1-2 CASSETTE COMPARTMENT LOCK HEIGHT ADJUSTMENT (Fig. 2)

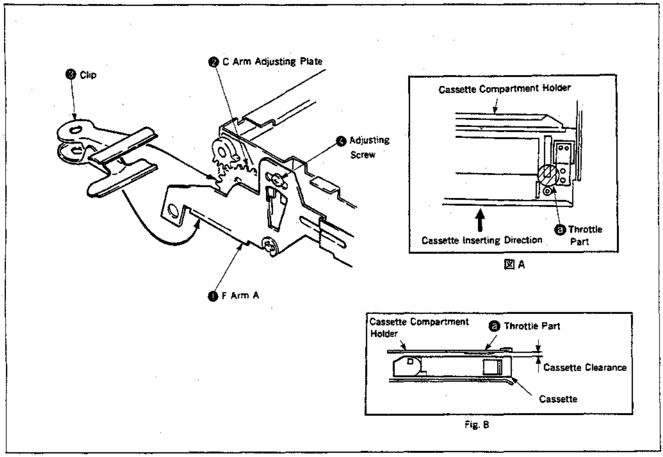
1) Using a spacer, etc., insert a 15.3mm-thick cassette to lock the cassette compartment.

Note : As shown in Fig. A, a 15.3mm-thick portion may be under the throttle partⓐ.

2) Pressing the partⓐ, nip the F arm A ❶ and the first tooth of the C arm adjusting plate ❷ with the clip ❸, and tighten the adjusting screw ❹ at a torque of 1kg•cm.

3) Apply Screw Lock to the adjusting screw ❹ after making sure of the following clearances between the throttle partⓐ of the cassette compartment holder and the cassette as shown in Fig. B.

- For 15mm-thick dummy cassette : 0.5 – 0.9
- For 15.2mm-thick dummy cassette : 0.3 – 0.7


❸ Clip
❷ C Arm Adjusting Plate
❹ Adjusting Screw
❶ F Arm A
Cassette Compartment Holder
Cassette Inserting Direction
ⓐ Throttle Part
Cassette Compartment Holder
ⓐ Throttle Part
Cassette Clearance
Cassette

図A

Fig. B

Fig. 2

1-3 OPERATION WITH CASSETTE COMPARTMENT HOLDER ASSEMBLY REMOVED

1. Putting into Loading state (Fig. 3)

1) Referring to the Service Manual, supply power with the cabinet and camera section removed. (Make the mechanism deck ready to operate.)
2) Place the cap ❷ on the LED assembly ❶.
3) Press the pin of the push switch ❸ (ON state) and fix it with adhesive tape ❹ in that state.
4) Press the locking plate release arm ❺ in an arrow direction. The set is made ready for loading.

2. Putting into the REC Mode

1) Short the TEST pins (SS-82 board CN404 pins ❷ and ❹ for CCD-V11/V88) to place into the TEST mode.

For CCD-V11/V88 ; SS-82 board CN404
TEST pin connector

4	GND
3	$\overline{\text{CAM ADJ}}$
2	$\overline{\text{TEST}}$
1	$\overline{\text{PATH}}$

The set is placed into the TEST mode by shorting the pins ❷ and ❹.

2) After completing the step 1), set the power switch to VTR (or CAMERA).
3) Turn on the REC switch. (If the set is placed in the TEST mode, detection of S and T reel table rotation is disabled and the tape can run.)

3. Putting into EJECT

1) Turn on the EJECT switch.

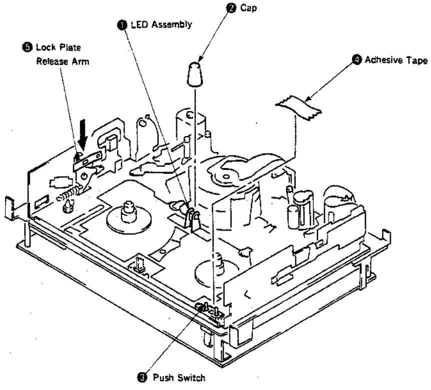


Fig. 3

1-4 HANDLING OF MODE SELECTOR

- Mount the MODE SELECTOR III panel to the mode selector. U, FL, O and O' mechanisms have different mode indications respectively. Select your disired type. (Fig. 4)

1. Construction (Fig. 5)

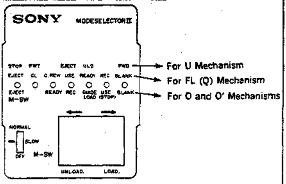
2. Connection (Fig. 6)

For CCD-VII/V88

1) Remove the plate, ornamental ❶.
2) Remove the screw ❷, and then, the LB-12 board ❸.
3) Remove the FP-114 flexible connector ❹ and loading motor connector ❺, and insert them into the MODE SELECTOR III conversion connector respectively.
4) Insert the M-SW connector of the mode selector into the MODE SELECTOR III conversion connector.

3. Handling

1) Use the M mode selector buttons only.
2) During mode selection, "BLANK" lights up when no mode is being selected.
3) If the right M mode selector button is kept pressed, EJECT, USE, GL, Q.REW, GL, REC and READY light up in that order.
4) When changing over from the READY mode back to the EJECT mode, press the left M mode selector button to select your desired mode.


SONY
MODESELECTOR III
STOP FWT EJECT ULD FWD
EJECT GL Q.REW USE READY REC BLANK
EJECT READY REC GUIDE LOAD USE (STOP) BLANK
M-SW
NORMAL
SLOW
OFF
M-SW
UNLOAD.
LOAD.
For U Mechanism
For FL (Q) Mechanism
For O and O' Mechanisms

Ref. No. J-13 MODE SELECTOR III Panel

Fig. 4

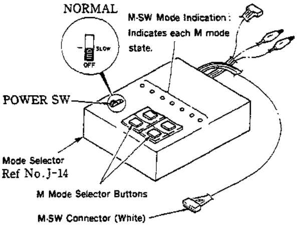

NORMAL
SLOW
OFF
M-SW Mode Indication: Indicates each M mode state.
POWER SW
Mode Selector
Ref No. J-14
M Mode Selector Buttons
M-SW Connector (White)

Fig. 5

For CCD-V11/V88

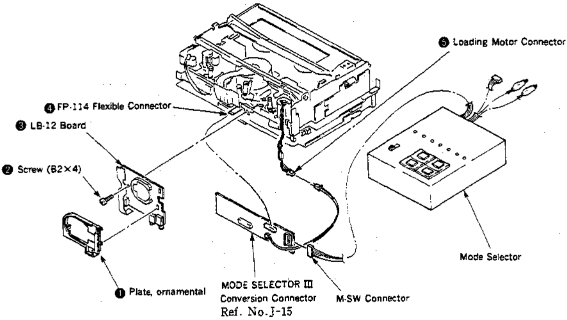
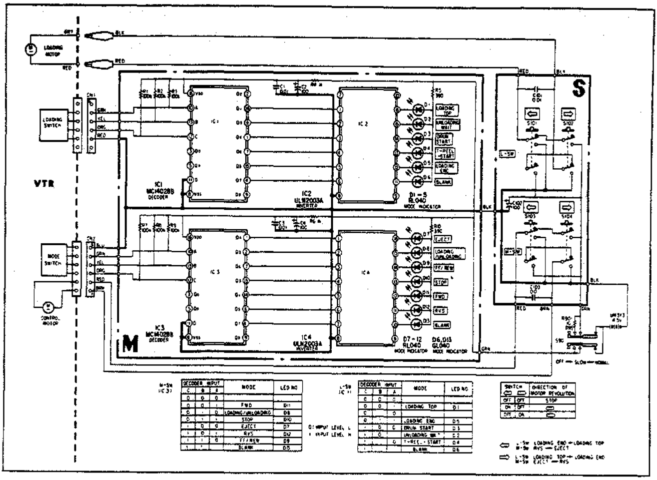

❺ Loading Motor Connector
❹ FP-114 Flexible Connector
❸ LB-12 Board
❷ Screw (B2×4)
❶ Plate, ornamental
MODE SELECTOR III
Conversion Connector
Ref. No. J-15
M-SW Connector
Mode Selector

Fig. 6

1-5 MODE SELECTOR SCHEMATIC DIAGRAM


LOADING MOTOR
LOADING SWITCH
MODE SWITCH
CONTROL MOTOR
VTR
IC1 MC14028B DECODER
IC2 ULN2003A INVERTER
IC3 MC14028B DECODER
IC4 ULN2003A INVERTER
D1~5 RL040 MODE INDICATOR
D7~12 RL040 MODE INDICATOR
D6, D13 GL040 MODE INDICATOR
LOADING TOP
UNLOADING WAIT
DRUM START
T-REEL START
LOADING END
BLANK
EJECT
LOADING/UNLOADING
FF/REW
STOP
FWD
RVS
S101
S102
S103
S104
L-SW
M-SW
S
M
OFF — SLOW — NORMAL

1-6 MODE SELECTOR PARTS LIST

Ref. No	Part No.	Description			
		CAPACITOR			
C1	1-108-579-00	MILER	0.01μF	50V	
C2	1-123-333-00	ELECT	100μF	24V	
C3	1-108-579-00	MILER	0.01μF	50V	
C4	1-123-333-00	ELECT	100μF	24V	
C101	1-108-579-00	MILER	0.01μF	50V	
C102	1-123-333-00	ELECT	100μF	24V	
C103	1-108-579-00	MILER	0.01μF	50V	
		DIODE			
D1	8-719-812-31	DIODE TLR123			
D2	8-719-812-31	DIODE TLR123			
D3	8-719-812-31	DIODE TLR123			
D4	8-719-812-31	DIODE TLR123			
D5	8-719-812-31	DIODE TLR123			
D6	8-719-812-33	DIODE TLG123A			
D7	8-719-812-31	DIODE TLR123			
D8	8-719-812-31	DIODE TLR123			
D9	8-719-812-31	DIODE TLR123			
D10	8-719-812-31	DIODE TLR123			
D11	8-719-812-31	DIODE TLR123			
D12	8-719-812-31	DIODE TLR123			
D13	8-719-812-33	DIODE TLG123A			
		IC			
IC1	8-752-240-28	IC	TC4028BP		
IC2	8-752-120-03	IC	μPA2003C		
IC3	8-759-240-28	IC	TC4028BP		
IC4	8-759-120-03	IC	μPA2003C		
		RESISTOR			
R1	1-247-179-00	CARBON	100K	1/4W	
R2	1-247-179-00	CARBON	100K	1/4W	
R3	1-247-179-00	CARBON	100K	1/4W	
R4	1-247-131-00	CARBON	1K	1/4W	
R5	1-247-121-00	CARBON	390	1/4W	
R6	1-247-131-00	CARBON	1K	1/4W	
R7	1-247-179-00	CARBON	100K	1/4W	
R8	1-247-179-00	CARBON	100K	1/4W	
R9	1-247-179-00	CARBON	100K	1/4W	
R10	1-247-121-00	CARBON	390	1/4W	
R901	1-214-594-00	METAL	10	1W	

2. PERIODIC CHECK AND MAINTENANCE

- Carry out the following maintenance and periodic checks in order not only to fully exhibit the functions and performance of the set, but also for the equipment and tape. After repairing, service the set as follows, regarless of the length of use.

2-1 CLEANING OF ROTARY DRUM ASSEMBLY

1) Gently apply chamois cloth (Ref. No. J-2) soaked in cleaning liquid (Ref. No. J-1) to the rotary drum assembly.
   Clean it by rotating the upper rotary drum assembly slowly counterclockwise by hand.

Note : Do not rotate the motor by power or rotate the upper rotary drum assembly clockwise by hand. Also, the head tip is highly likely to be damaged if the chamois cloth is moved in a pependicular direction to the it. Make sure to follow the instructions above for cleaning the rotary drum assembly.

2-2 CLEANING OF TAPE PATH (Fig. 7)

1) In the EJECT mode, clean the tape running system (TG-1, -2, -3, -4, -5, -6, -7, -8, -9, -10, -11, pinch roller, and capstan shaft) and the lower drum, using a superfine applicator (Ref. No. J-3) soaked in the cleaning liquid.

Note : Note that no oil or grease of each link mechanism adheres to the superfine applicator (Ref. No. J-3).

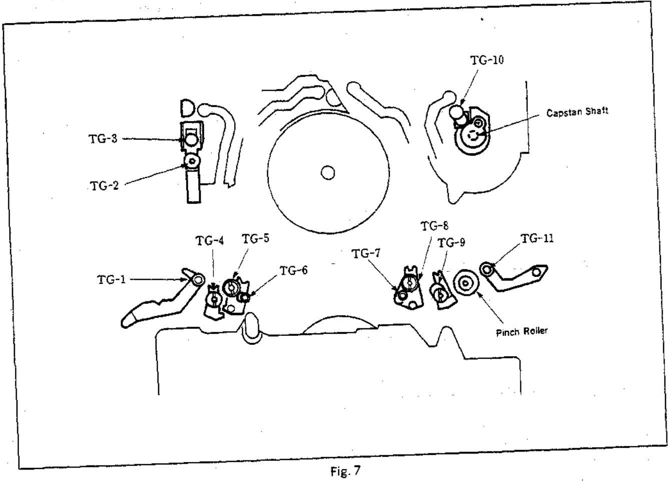


Fig. 7

2-3 PERIODIC CHECK ITEMS

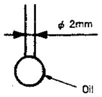
	Location of Maintenance and check	Hours of Use (H)										Remarks
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
Tape trans-portion System	Cleaning of tape path surface	○	○	○	○	○	○	○	○	○	○	Be careful of oil
	Cleaning and degaussing of rotary assembly	○	○	○	○	○	○	○	○	○	○	Be careful of oil
Driving System	Relay belt	—	☆	—	☆	—	☆	—	☆	—	☆	3-728-212-01
	Capstan shaft	—	◎	—	◎	—	◎	—	◎	—	◎	Be adsolutely careful not to get oil on the tape path surface.
	Relay pulley sheft	—	◎	—	◎	—	◎	—	◎	—	◎	
	Loading motor	—	☆	—	☆	—	☆	—	☆	—	☆	1-541-607-11
Performance Confirmation	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	—	☆	—	☆	—	☆	—	☆	—	☆	
	Brake system	—	☆	—	☆	—	☆	—	☆	—	☆	
	FWD. RVS torque measurement	—	☆	—	☆	—	☆	—	☆	—	☆	

○ : Cleaning ◎ : Oil ☆ : Confirmation

Note : When overhauling, refer to the items above to replace parts.

Note : Concerning oil

- Be sure to use specified oil. (If you use oil with different visicosity, etc., it may cause troubles.)
  Oil : Part No. 7-661-018-18 (Mitsubishi Diamond Oil Hydrofluid NT-68)
- When lubricating bearings, be sure use oil free from dust, etc. (If you use oil with dust, etc. contained, it may cause bearings to be worn out or seized.)
- A drip of oil refers to an amount attached to the tip of a φ 2mm stick shown in the right figure.

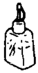


2-4 Service jigs list

Ref. No.	Neme	Part No.	Fixture No.	Usage and Others
J-1	Cleasing fluid	Y-2031-001-0	—	
J-2	Cleasing cloth	2-034-697-00	—	
J-3	Super fine applicator (Made by NIPPON APPLICATOR, P752D)		—	
J-4	Head degausser	Widely available	—	
J-5	Small mirror for adjustment Spare mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape path
J-6	Alignment tape NTSC (WR5-1N) PAL (WR5-1C)	8-967-995-01 8-967-995-06		Tape path
J-7	Dial tension gauge	J-6080-827-A		Various torque measurement
J-8	Tension measurement reel	J-6080-831-A		With ϕ30 tape
J-9	FWD and RVS winding torque cassette	J-6080-824-A	GD-2086	
J-10	Drum screwdriver (Hexagonal wrench screwdriver)	7-700-766-01		
J-11	Screwdriver for tape path	J-6082-026-A		For tape guide adjustment
J-12	Mode selector Ⅲ panel	J-6082-023-A		
J-13	Mode selector	J-6080-825-A		For all models
J-14	Mode selector Ⅲ conversion connector	J-6082-021-A		

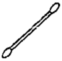
Other equipment
- Oscilloscope
- Analog tester (20kΩ)

J-1

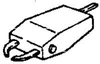


J-2

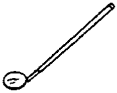
J-3



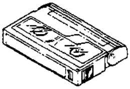
J-4



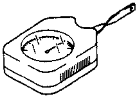
J-5



J-6



J-7



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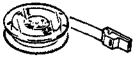

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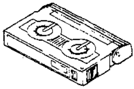

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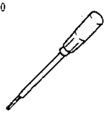
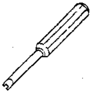
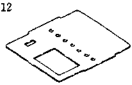


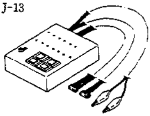
J-11



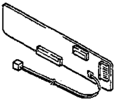
J-12



J-13



J-14



3. MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

Note : Use the mode selector (Ref. No. J-14) for the following mechanical checks, adjustments and replacements.

Note : The modes in ☐ are those set by pressing the mode selector buttons.

3-1 LED BASE (Fig. 8)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assembly.
3) As shown in Fig. A, rotate the LED in a direction of the arrow Ⓐ and remove it in a direction of the arrow Ⓑ.
4) Remove the three screws ❶, ❷ and ❸.
5) Lifting the LED base ❹, remove it by pushing it in a direction of the arrow Ⓒ.

Note : Dismount and remount the LED base carefully, because its holder is easily deformed.

2. Mounting

1) Select the USE mode.
2) Put the claw ❺ of the LED base ❹ in the notch ❼ of the LS chassis without catching the LED in between. Next, fit to the dowels ❻ at 2 places.
3) Mount and tighten the screws ❶, ❷ and ❸ in that order.
4) As shown in Fig. B, set the LED in a direction of the arrow Ⓐ and rotate it in a direction of the arrow Ⓑ to fix.
5) As shown in Fig. C, bend a flexible boord and put it in the holder.

Note : In the step2), make sure that the barring ❽ of the arm assy, gear can appears in the hole of the LED base. (Fig. D)

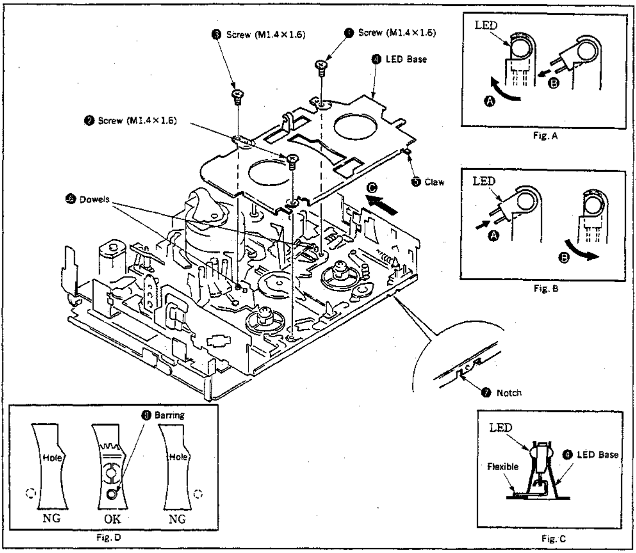

❸ Screw (M1.4×1.6)
❶ Screw (M1.4×1.6)
❹ LED Base
❷ Screw (M1.4×1.6)
❺ Claw
❻ Dowels
Ⓒ
❼ Notch
LED
Ⓐ
Ⓑ
LED
Ⓐ
Ⓑ
❽ Barring
Hole
Hole
NG
OK
NG
LED
❹ LED Base
Flexible

Fig. A

Fig. B

Fig. D

Fig. C

Fig. 8

3-2 RL BASE ASSEMBLY, RETAINER (Fig. 9)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assemlby.
3) Referring to 3-1, remove the LED base.
4) Remove the screw ❶, and then, retainer ❷.
5) Remove the screw ❸, and then, RL base assembly ❹.

2. Mounting

1) Select the USE mode.
2) With the screw ❸, mount the RL base assembly ❹ to the LS chassis.
3) With the screw ❶ fix the retainer ❷ to the RL base assembly ❹.
   When this is done, align the bump part ※ of the retainer ❷ with the bump part ※ of the guide rail T. (Fig. A)
4) Referring to 3-1, mount the LED base.
5) Referring to 1-1, mount the cassette compartment holder assembly.

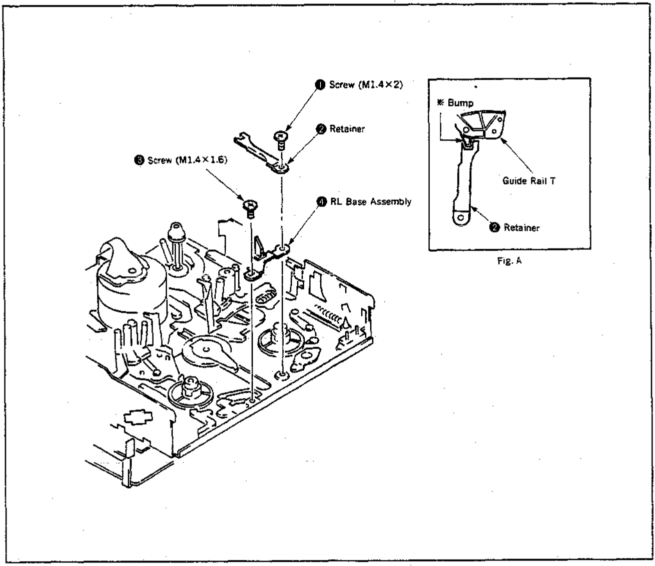

❶ Screw (M1.4×2)
❷ Retainer
❸ Screw (M1.4×1.6)
❹ RL Base Assembly
※ Bump
Guide Rail T
❷ Retainer
Fig. A

Fig. 9

3-3 TABLE ASSY, REEL, SUPPLY (Fig. 10)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assembly.
3) Referring to 3-1, remove the LED base.
4) As shown in Fig. A, making use of slackness of the tension regulator string ❸ in the USE mode, remove the string out of the groove of the table assy, reel, supply ❶. When this is done, be careful not to bend the tension regulator string ❸ and the S soft arm ❹ must be moved in a direction of the arrow Ⓑ.
5) Remove the table assy, reel, supply ❶.

Note : Dismount and remount the table assy, reel, supply ❶, holding the reel claw ※.

2. Mounting

1) Select the USE mode.
2) As shown in Fig. B, move the S soft arm ❹ in a direction of the arrow Ⓑ.
3) Avoiding the tension regulator string ❸, mount the table assy, reel, supply ❶ to the shaft ❷.
4) Put the tension regulator string ❸ in the groove of the table assy, reel, supply ❶ and fit it properly by turning the table assy, reel, supply ❶.
5) Referring to 3-1, mount the LED base.
6) Referring to 1-1, mount the cassette compartment holder assembly.

Note : Do not touch the tension regulator string ❸ with naked hand. Also, be careful of adhesion of grease, etc.

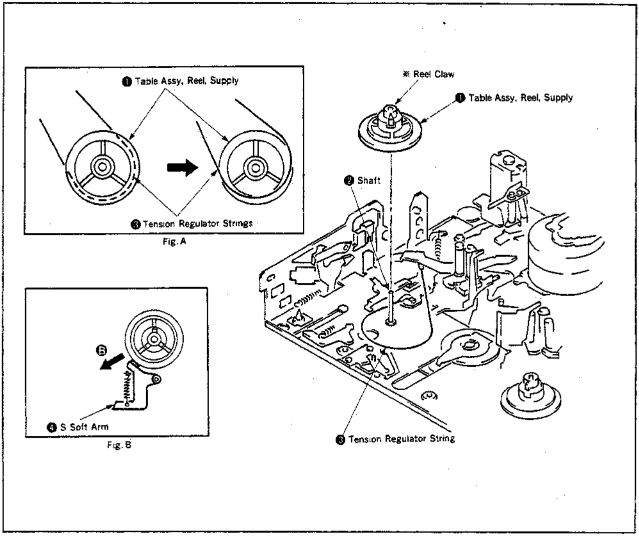

❶ Table Assy, Reel, Supply
❸ Tension Regulator Strings
Ⓑ
❹ S Soft Arm
※ Reel Claw
❶ Table Assy, Reel, Supply
❷ Shaft
❸ Tension Regulator String

Fig. A

Fig. B

Fig. 10

3-4 TABLE ASSY, REEL, TAKE-UP (Fig. 11)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assembly.
3) Referring to 3-1, remove the LED base.
4) Referring to 3-2, remove the retainer.
5) Dispace the T ratchet ❶ in a direction of the arrowⒶ.
6) With the claw (T ratchet head) of the T ratchet ❶ moved in a direction of the arrowⒷ, remove the Table assy, reel, take-up ❷.

Note : Dismount and remount the Table assy, reel, take-up ❷, holding the reel claw ※.

2. Mounting

1) Select the USE mode.
2) With the claw (T ratchet head) of the T ratchet ❶ moved in an arrow direction, mount the Table assy, reel, take-up ❷ to the shaft ❸.
3) Referring to 3-2, mount the retainer.
4) Referring to 3-1, mount the LED base.
5) Referring to 1-1, mount the cassette compartment holder assembly.

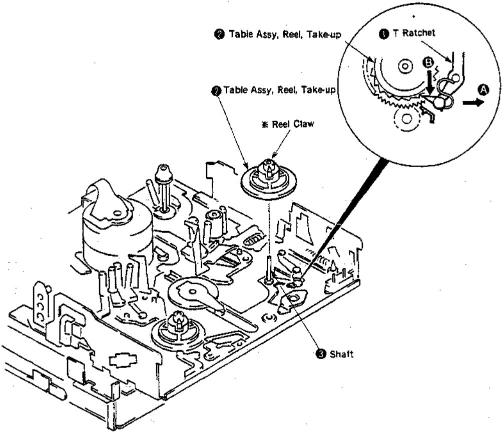


Fig. 11

3-5 ONEWAY CLUTCH ASSEMBLY (Fig. 12)

1. Removal

1) Select the USE mode.
2) Referring to the cassette compartment holder assembly.
3) Referring to 3-1, remove the LED base.
4) Remove the screw ❶, and then, oneway clutch assembly ❷.

2. Mounting

1) Select the USE mode.
2) Mount the oneway clutch assembly ❷ to the LS chassis and fix with the screw ❶.
3) Referring 3-1, mount the LED base.
4) Referring to 1-1, mount the cassette compartment holder assembly.

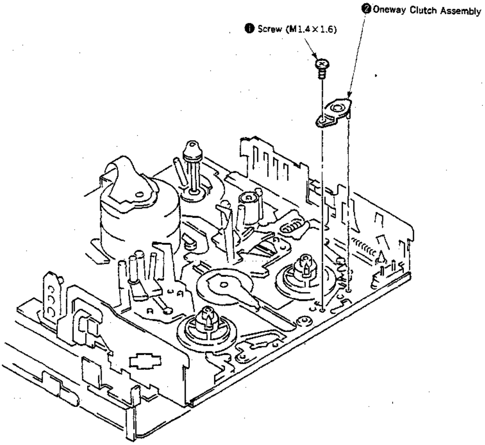


Fig. 12

3-6 S SOFT ARM ASSEMBLY (Fig. 13)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assembly.
3) Referring to 3-1, remove the LED base.
4) Rerove the lock washer ❶, and then, the spring, tension ❷.
5) Remove the S soft arm assembly ❸ by rotating it in an arrow direction (until the hook ❺ comes off the LS chassis).

2. Removal

1) Select the USE mode.
2 As shoms in Fig. A, apply a quarter drip of oil to the arrowindicated part of the shaft ❹.
3) Mount the S soft arm assembly ❸ to the shaft ❹, rotating it in as arrow direction. (Be careful not to bend the hook ❺.)
4) Hook the spring, tension 2 onto the claw and fix it with lock washer 1.
5) Referring to 3-1, mount the LED base.
6) Referring to 1-1, mount the cassette compartment holder assembly.

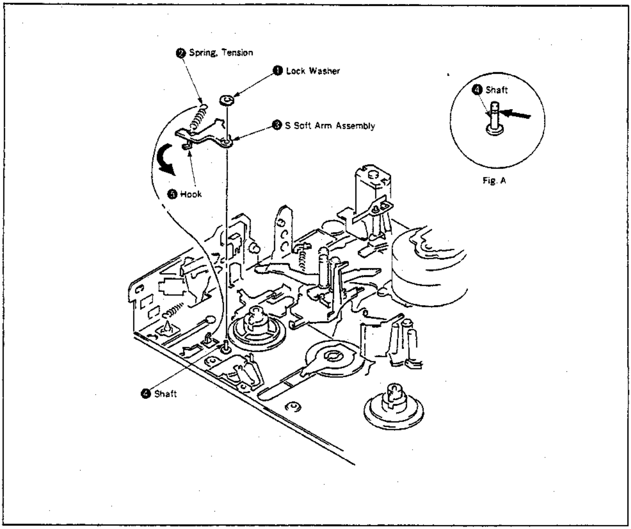


Fig. 13

3-7 LS CHASSIS ASSEMBLY (Fig. 14)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder.
3) Referring to 3-1, remove the LED base.
4) Referring to 3-2, remove the RL base assembly and retainer.
5) Remove the lock washer ❶, and then, arm assy gear ❷.
6) Select the Q. REW mode.
7) Remove the flexible rotary shaft ❸, and then, the flexible connector ❹.
8) Remove the E retaining ring ❺ and three screws ❻.
9) Remove the LS chassis assembly ❼ in a direction of the arrow Ⓓ.

2. Mounting

1) As shown in Fig. A, apply Molyton grease to the arrow-indicated part of the LS chassis assembly ❼.
2) Unload in the RDY mode. Start docking in the Q. REW mode after first GL. When docking the mechanical chassis and LS chassis assembly ❼, it is necessary to place the following parts at specified positions.
3) Put the pin ㉔of the pinch arm assembly ㉓into the left side of the pinch press arm assembly㉕. (Fig.19)
4) Move the TG-1 arm assembly⓯in a direction of the arrow Ⓐ to put the pin ⓰into the concave of the arm assembly ⓱. (Fig. 17)
5) put the pin⓳of the S ratchet⓲into the right side the of the arm assembly⓱. (Fig. 17)

Simultaneously performing the operations above, push the roller of the guide lock arm ⓾ With the arm arc portion of the guide arm T assembly⓫ (Fig. 15) to push the LS chassis assembly ❼ in a direction of the arrow Ⓔ. and at the same time, engage the claws of the guide rail base 1⓬, guide rail base 2⓭and guide rail base3⓮with those of the guide rail S㉖ and guide rail T㉗. (Fig. 16)

Then, align the shafts ❾ of the mechanical chassis With the four long joints of the LS chassis assembly ❼, and put the LS pin㉑of the LS arm assembly⑳in the groove of the LS cam plate㉒. (Fig.18)

Note : Before docking, confirm that both EJ arm and LS arm are deeply inserted into the shafts. (If not properly fit, the set does not function even if the LS chassis is docked.

6) Mount the E retaining ring ❺ and three screws ❻.
7) Mount the flexible rotary shaft ❸ and flexible connector ❹.
8) Select the USE mode.
9) Mount the arm assy gear ❷ and fix with the lock washer ❶.
10) Referring to 3-2, mount the RL base assembly and retainer.
11) Referring to 3-1, mount the LED base.
12) Referring to 1-1, mount the cassette compartment holder assembly.

Note : Using the mode selector, confirm that loading and unloading are performed smoothly.

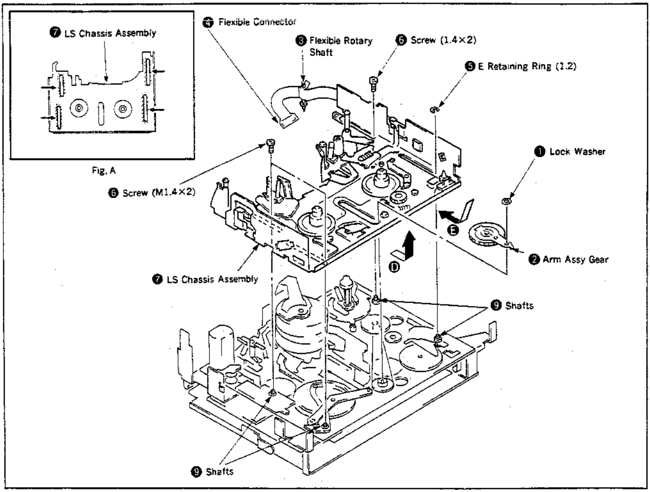


Fig. 14

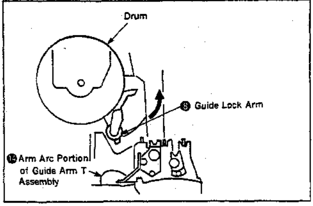

Drum
⑧ Guide Lock Arm
⑭ Arm Arc Portion of Guide Arm T Assembly

Fig. 15

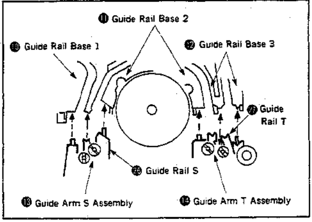

⑪ Guide Rail Base 2
⑩ Guide Rail Base 1
⑫ Guide Rail Base 3
㉗ Guide Rail T
㉖ Guide Rail S
⑬ Guide Arm S Assembly
⑭ Guide Arm T Assembly

Fig. 16

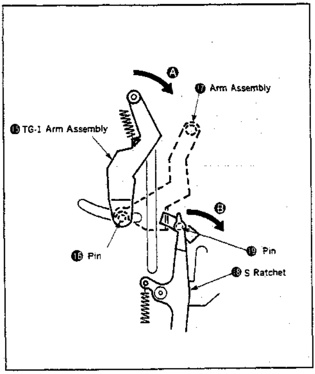

Ⓐ
⑰ Arm Assembly
⑮ TG-1 Arm Assembly
Ⓑ
⑯ Pin
⑲ Pin
⑱ S Ratchet

Fig. 17

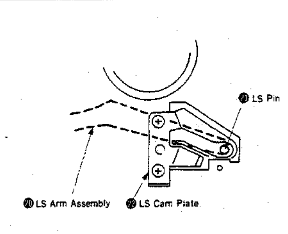

㉑ LS Pin
⑳ LS Arm Assembly
㉒ LS Cam Plate

Fig. 18

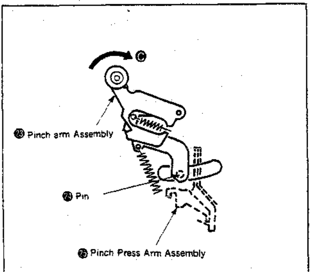

Ⓒ
㉓ Pinch arm Assembly
㉔ Pin
㉕ Pinch Press Arm Assembly

Fig. 19

3-8 PINCH ARM ASSEMBLY (Fig. 20)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis assembly.
3) Remove the lock washer ❷ from the back of the LS chassis assembly ❶.
4) Remove the spring, tension ❸, and then, pinch arm assembly ❹.

2. Mounting

1) As shown in Fig. A, apply oil to the hole of the boss ❺ over one third of a drip up to half a drip.
2) put the rotation center of the pinch arm assembly in the boss ❺ hole, and the pin ❻ in the long hole.
3) Hook the spring, tension ❸ onto the upper groove of the pinch return spring shaft ❼.
4) Mount the lock washer ❷ from the back of the LS chassis assembly ❶.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 1-1, mount the cassette compartment holder assembly.

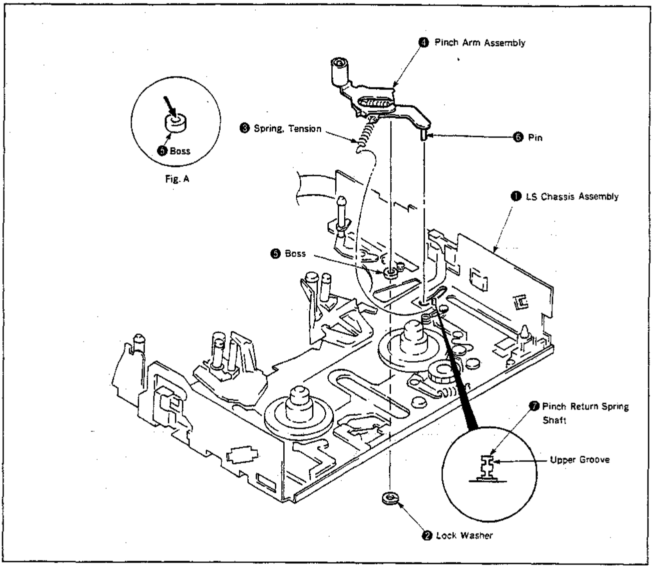

❹ Pinch Arm Assembly
❸ Spring, Tension
❻ Pin
❺ Boss
Fig. A
❶ LS Chassis Assembly
❺ Boss
❼ Pinch Return Spring Shaft
Upper Groove
❷ Lock Washer

Fig. 20

3-9 TG-11 ARM ASSEMBLY (Fig. 21)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis assembly.
3) Remove the lock washer ❷ from the back of the LS chassis assembly ❶.
4) Remove the TG-11 arm assembly ❸ and spring, torsion ❹.

Note : Be careful not to deform the TG-11 arm.

2. Mounting

1) As shown in Fig. A, apply oil to a boss hole over one third of a drip up a half a drip.
2) As shown in Fig. B, put the longer arm of the spring, torsion ❹ between the pinch arm boss ❺ and cam slider shaft ❽ of the LS chassis. Next, Hook the shorter arm of the spring, torsion ❹ around the pin ❻ of the TG-11 arm assembly ❸, rotate the TG-11 arm assembly and fix with the lock washer ❷. When this is done, see to it that the pin ❻ of the TG-11 arm assembly ❸ is located to the left side of the cam slider ❾ as shown in Fig. C.
3) Referring to 3-7, mount the LS chassis.
4) Referring to 1-1, mount the cassette compartment holder.

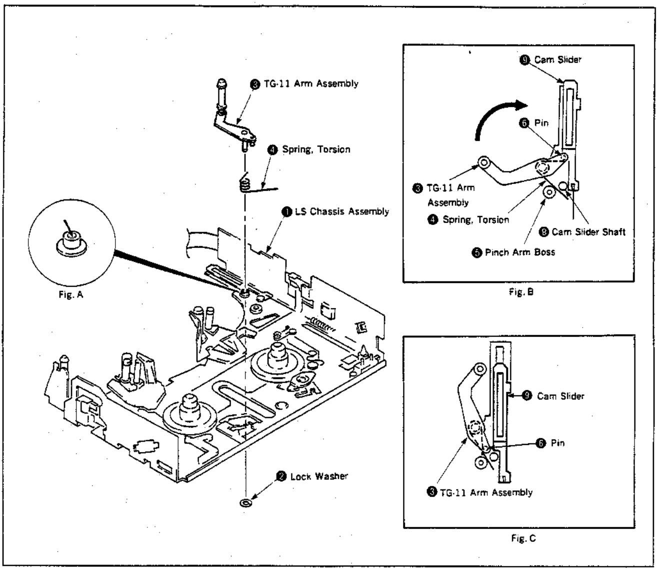

❸ TG-11 Arm Assembly
❹ Spring, Torsion
❶ LS Chassis Assembly
❷ Lock Washer
Fig. A
❾ Cam Slider
❻ Pin
❸ TG-11 Arm Assembly
❹ Spring, Torsion
❽ Cam Slider Shaft
❺ Pinch Arm Boss
Fig. B
❾ Cam Slider
❻ Pin
❸ TG-11 Arm Assembly
Fig. C

Fig. 21

3-10 TG-1 ARM ASSEMBLY (Fig. 22)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis.
3) Referring to 3-3, remove the table assy, reel, supply.
4) Remove the lock washer ❷ from the back of the LS chassis assembly ❶.
5) Remove the spring, tension ❸. Remove the string joint ❹ from the dowel ❺ of the TG-1 adjustment block ❾ by rotating it in a direction of the arrow Ⓐ as shown in Fig. C.
6) Remove the TG-1 arm assembly ❻.

Note : Dismount and remount the string joint ❹ carefully not to deform it.

2. Mounting

1) As shown in Fig. A, apply oil to the hole of the boss ❼ over one third of a drip up to half a drip.
2) As shown in Fig. C, mount the string joint ❹ to the TG-1 adjustment block ❾ in the opposite direction of the arrow Ⓐ.
3) Mount the TG-1 arm assembly ❻ to the boss ❼ in such a manner not to touch the guide and insert the pin ❽ into the long hole.
4) Hook the spring, tension ❸ onto the position shown in Fig. B.
5) Mount the lock washer ❷ from the back of the LS chassis assembly ❶.
6) Referring to 3-3, mount the table assy, reel, supply.
7) Referring to 3-7, mount the LS chassis assembly.
8) Referring to 1-1, mount the cassette compartment holder assembly.

Note : Referring to 3-27, adjust a tension regulator position.

Note : Referring to 3-28, adjust a FWD back tension.

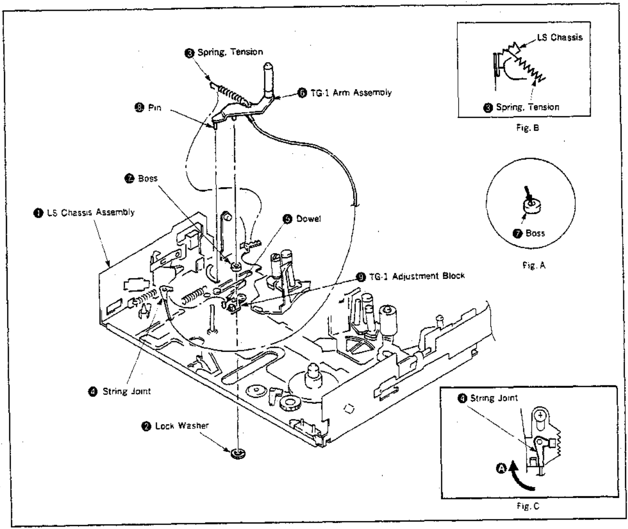

❸ Spring, Tension
❻ TG-1 Arm Assembly
❽ Pin
❼ Boss
❶ LS Chassis Assembly
❺ Dowel
❾ TG-1 Adjustment Block
❹ String Joint
❷ Lock Washer
LS Chassis
❸ Spring, Tension
Fig. B
❼ Boss
Fig. A
❹ String Joint
Ⓐ
Fig. C

Fig. 22

3-11 STRING JOINT (Fig. 23)

1. Removal

1) Referring to 3-10, remove the TG-1 arm assembly ❶.
2) Remove the joint holder ❷, and then, string assembly ❸.

2. Mounting

1) Put the dowel ❹ of the TG-1 arm assembly ❶ into the hole of the string assembly ❸ and mount the joint holder ❷. (Apply screw lock between the joint holder and TG-1 arm assembly.)
2) Referring to 3-10, mount the TG-1 arm assembly ❶.

Note : Be careful not to bend the string assembly ❸.

Note : Do not touch the guide ※.

Note : The joint holder ❷, which was removed once, must not be used again.

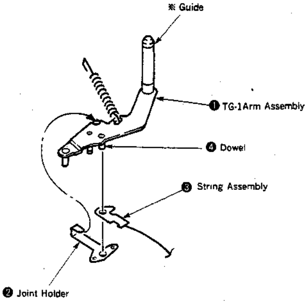

※ Guide
❶ TG-1Arm Assembly
❹ Dowel
❸ String Assembly
❷ Joint Holder

Fig. 23

3-12 GUIDE ARM T ASSEMBLY, GUIDE ARM S ASSEMBLY

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis assembly.
3) Rotate the guide arm T assembly ❶ and guide arm S assembly in arrow directions respectively, align their shafts ❸ with the holes as shown in Fig. A, and remove them. (Fig. 24)

Note : Do not touch the guide ※. (Fig. 25 and Fig. 26)

2. Mounting

1) After inserting the guide arn T and S assemblies in the reverse order of removal, rotate them in the opposite directions of the arrows respectively.
2) Fit the TG-7 base assembly ❺ and TG-9 base assembly ❻ in the grooves of the guide rail T ❹. (Fig. 25)
3) Put the shaft ⓬ flange in the long groove of the guide rail S ❽, and fit the TG-4 base assembly ❾ and TG-6 base assembly ❿ into the right and left grooves of the guide rail S ❽ respectively.

   When this is done, see to it that the flat spring of the TG-6 base assembly ❿ is located below the guide rail S ❽ as shown in Fig. B. (Fig.26)
4) Referring to 3-7, mount the LS chassis assembly.
5) Referring to 1-1, mount the cassette compartment holder assembly.

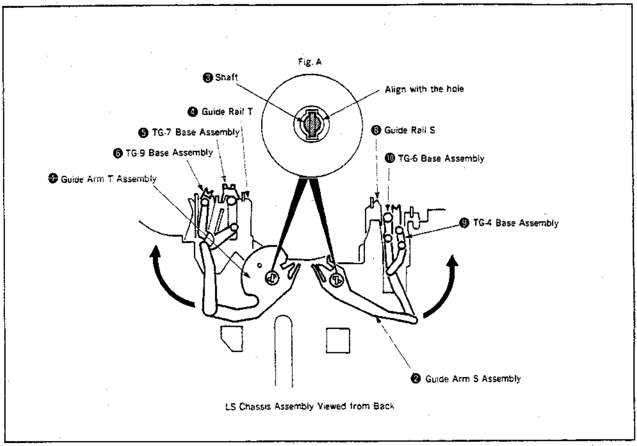


Fig. A
❸ Shaft
Align with the hole
❹ Guide Rail T
❺ TG-7 Base Assembly
❻ TG-9 Base Assembly
❶ Guide Arm T Assembly
❽ Guide Rail S
❿ TG-6 Base Assembly
❾ TG-4 Base Assembly
❷ Guide Arm S Assembly

LS Chassis Assembly Viewed from Back

Fig. 24

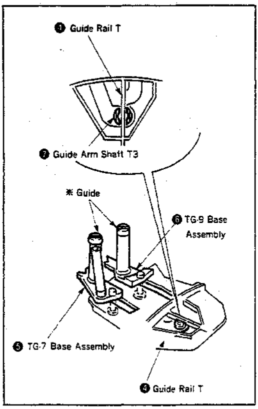

❹ Guide Rail T
❼ Guide Arm Shaft T3
✻ Guide
❻ TG-9 Base Assembly
❺ TG-7 Base Assembly
❹ Guide Rail T

Fig. 25

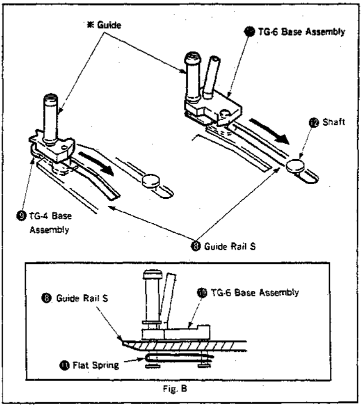

✻ Guide
❿ TG-6 Base Assembly
⓬ Shaft
❾ TG-4 Base Assembly
❽ Guide Rail S
❽ Guide Rail S
❿ TG-6 Base Assembly
⓫ Flat Spring

Fig. B

Fig. 26

3-13 PINCH PRESS ARM ASSEMBLY (Fig. 27)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis.
3) Remove the screw ❶, and then, pinch press arm assembly ❷.

2. Mounting

1) As shown in A, apply half a drip of molyton grease to an arrowindicated part of a boss hole.
2) As shown in Fig. B, apply half a drip of molyton grease each to the pinch press arm assembly ❷ at 3 places.
3) Put the pin ❹ of the pinch press arm assembly ❷ in the groove of the cam B ❸.
4) Fix. with the screw ❶.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 1-1, mount the cassette compartment holder assembly.

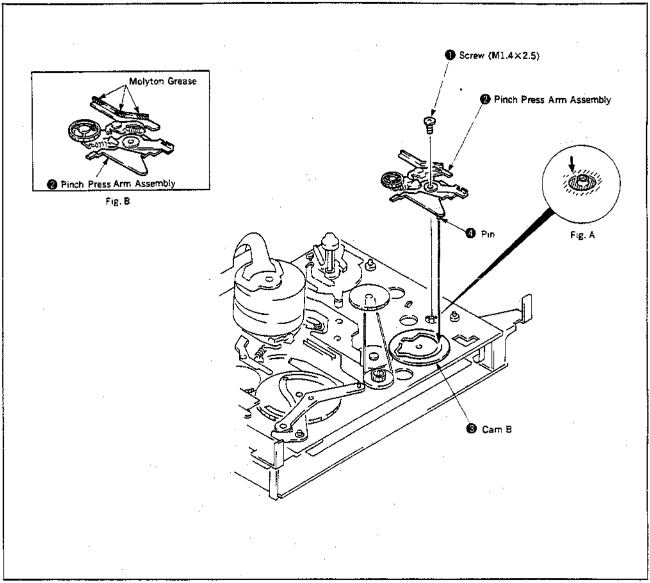

Molyton Grease
❷ Pinch Press Arm Assembly
Fig. B
❶ Screw (M1.4×2.5)
❷ Pinch Press Arm Assembly
❹ Pin
Fig. A
❸ Cam B

Fig. 27

3-14 GL SLIDER ASSEBLY (Fig. 28)

1. Removal

1) Refering to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis assembly.
3) Referring to 3-15, remove the cam A.
4) Shift the GL slider assembly ❹ in a direction of the arrow Ⓐ.
5) Remove the screw ❶, and then, GL support S ❷.
6) Remove the lock washer ❸, and then, GL slider assembly ❹.

2. Mounting

1) Fit the claw ❺ of the GL slider assembly ❹ in the groove of the GL support T ❼, and put the roller ❻ in the long hole of the chassis.
2) Stop with the lock washer ❸.
3) Shift the GL slider assembly ❹ in a direction of the arrow Ⓐ.
4) Fit the claw ❽ of the GL support ❷ in the part of the chassis marked with ※ and place the dowel ❾ in the hole of the chassis.
5) Fix with the screw ❶.
6) Referring to 3-7, mount the LS chassis assembly.
7) Referring to 1-1, mount the cassette compartment holder assembly.

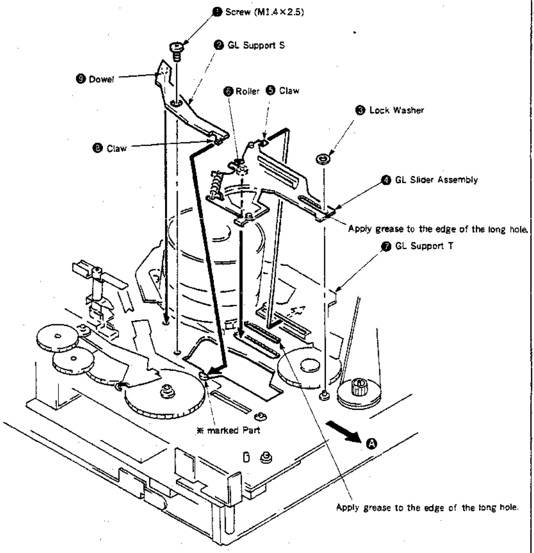

❶ Screw (M1.4×2.5)
❷ GL Support S
❾ Dowel
❻ Roller
❺ Claw
❸ Lock Washer
❽ Claw
❹ GL Slider Assembly
Apply grease to the edge of the long hole.
❼ GL Support T
※ marked Part
Ⓐ
Apply grease to the edge of the long hole.

Fig. 28

3-15 PHASE ADJUSTMENT(Fig. 29)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis. (Wen this is done, one of the BLANK, REC and READY modes must be selected.)
3) Remove the two screws ❶, and remove the TG-1 cam base ❷ by moving it in a direction of the arrow Ⓐ. (Remove the notch ㉒ from the groove of the No. 3 gear shaft.)
4) Remove the screw ❸, and remove the gear retainer ❹ by sliding it in a direction of the arrow Ⓑ.
5) Remove the arm assembly ❺, No. 0 gear ❻, No. 1 gear assembly ❼, No. 2 gear assembly ❽, No. 3 gear assembly ❾, lock washer ㉓, and then, mode gear assembly ❿, respectively.
6) Being careful not to lose the LS roller ⓴ of the LS arm, remove the LS arm assembly ⓫ and EJ arm ⓬, respectively.
7) Remove the screw ⓭, and then, cam A ⓮.
8) Referring to 3-13 3), remove the pinch press arm assembly.
9) Remove the screw ⓯, and then, cam B ⓰.

2. Adjustment and Mounting

1) Face the hole ⓐ of the mode gear assembly ❿ to a direction of the arrow Ⓐ, move the GL slider assembly ⓱ in a direction of the arrow Ⓑ, apply molyton grease to the pin of the GL slider assembly ⓱, and mount the LS roller ⓴. (Fig. 30)
2) Set a direction of the cam A ⓮ so that the hole Ⓒ of the cam A ⓮ will be aligned with the hole of the mechanical chassis. (Fig. 31)
3) Move the GL slider ⓱ so that the LS roller ⓴ will be placed into the groove ⓓ of the cam A ⓮. At the same time, engage the mode gear assembly ❿ with the gear of the relay gear A ⓲, and mount the cam A ⓮. Insert a stick of about ϕ1.5mm in the hole Ⓒ of the cam A ⓮. (Fig. 31)
4) Align the hole ⓔ of the cam B ⓰ with the hole of the mechanical chassis. At the same time, engage the relay gear B ⓳ with the gear and mount it. (Fig. 32)
5) Referring to 3-13, mount the pinch press arm assembly.
6) Align the hole ⓕ of the No. 3 gear assembly ❾ with the hole of the mechanical chassis, and at the same time, engage the mode gear assembly ❿ with the gear to mount. (Fig. 33)
7) Mount the No. 2 gear assembly ❽, No. 1 gear assembly ❼ and No. 0 gear ❻ in that order. Mount the arm assembly ❺ to the shaft and put the pin ㉑ in the groove of the No. 3 gear assembly ❾. (Fig. 34)
8) Put the TG-1 cam base ❷ in place, fit the notch ㉒ to the shaft and shift it in an arrow direction, and mount the screws ❶ and ❶' in that order. (Fig. 35)
9) Put the gear retainer ❹ in place, slide it in an arrow direction and fix it with the screw ❸. (Fig. 36)
10) Seeing to it that the EJ arm ⓬ and the LS roller ⓴ of the LS arm assembly ⓫ are put in the groove Ⓖ of the cam A ⓮, mount them in that order. (Fig. 29 and Fig. 30)
11) Referring to 3-7, mount the LS chassis assembly.
12) Referring to 1-1, mount the cassette compartment holder assembly.

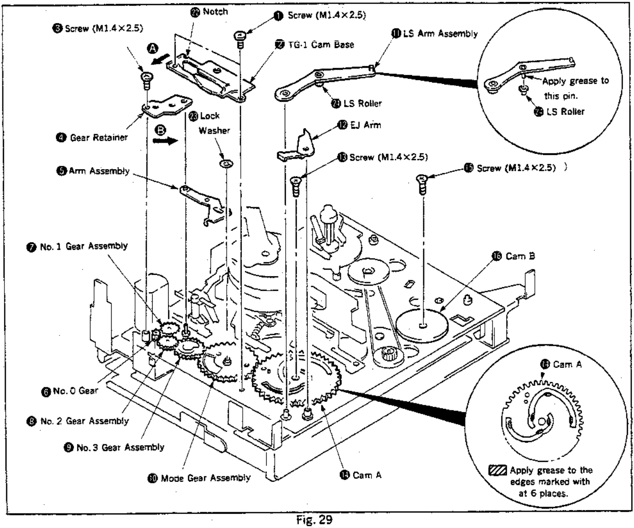

㉒ Notch
❶ Screw (M1.4×2.5)
❸ Screw (M1.4×2.5)
Ⓐ
❷ TG-1 Cam Base
⓫ LS Arm Assembly
Apply grease to this pin.
⓴ LS Roller
⓴ LS Roller
㉓ Lock Washer
❹ Gear Retainer
Ⓑ
⓬ EJ Arm
⓭ Screw (M1.4×2.5)
⓯ Screw (M1.4×2.5)
❺ Arm Assembly
❼ No. 1 Gear Assembly
⓰ Cam B
⓮ Cam A
❻ No. 0 Gear
❽ No. 2 Gear Assembly
❾ No. 3 Gear Assembly
❿ Mode Gear Assembly
⓮ Cam A
▨ Apply grease to the edges marked with at 6 places.

Fig. 29

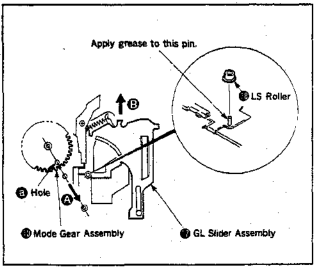

Apply grease to this pin.
⓲ LS Roller
Ⓑ
ⓐ Hole
Ⓐ
❿ Mode Gear Assembly
⓱ GL Slider Assembly

Fig. 30

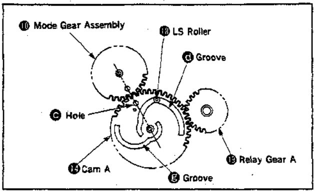

❿ Mode Gear Assembly
⓲ LS Roller
ⓓ Groove
ⓒ Hole
⓳ Relay Gear A
⓮ Cam A
ⓔ Groove

Fig. 31

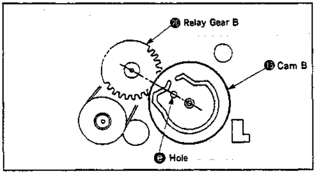

⓴ Relay Gear B
⓯ Cam B
ⓔ Hole

Fig. 32

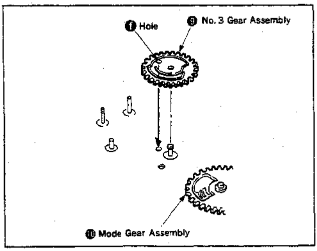

ⓕ Hole
❾ No. 3 Gear Assembly
❿ Mode Gear Assembly

Fig. 33

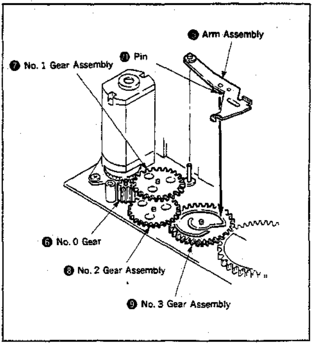

❺ Arm Assembly
(21) Pin
❼ No. 1 Gear Assembly
❻ No. 0 Gear
❽ No. 2 Gear Assembly
❾ No. 3 Gear Assembly

Fig. 34

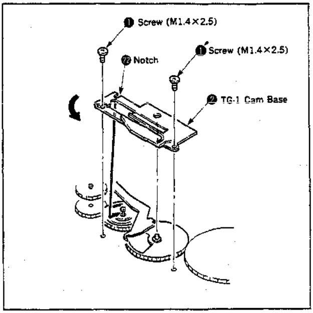

❶ Screw (M1.4×2.5)
(22) Notch
❶' Screw (M1.4×2.5)
❷ TG-1 Cam Base

Fig. 35

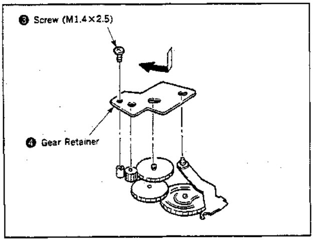

❸ Screw (M1.4×2.5)
❹ Gear Retainer

Fig. 36

3-16 GEAR TRAIN OPERATION CHECK (Fig. 37)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis.
3) Referring to 3-17, remove the loading motor.

2. Check

1) Insert the tip of tweezers into the hole a of the cam A ❶.
2) Rotate the cam A ❶ by about two thirds of a turn in a direction of the arrow Ⓐ, and then, in a direction of the arrow Ⓑ by the same amount. Repeat this 3 times.
3) When this is done, check that each, gear, the GL slider assembly and LS arm assembly rotate smoothly, and that no load is applied to them.
4) At the same time, check that the LS roller ❷ is located almost at the end point of the groove of the cam A ❶ when the gear train comes into contact with the stoppers at both ends.

Note : When rotating the cam A ❶ with the tip of tweezers, etc., be careful not to scratch the mechanical chassis.

3. Mounting

1) Referring to 3-17, mount the loading motor.
2) Referring to 3-7, mount the LS chassis assembly.
3) Referring to 1-1, mount the cassette compartment holder assembly.

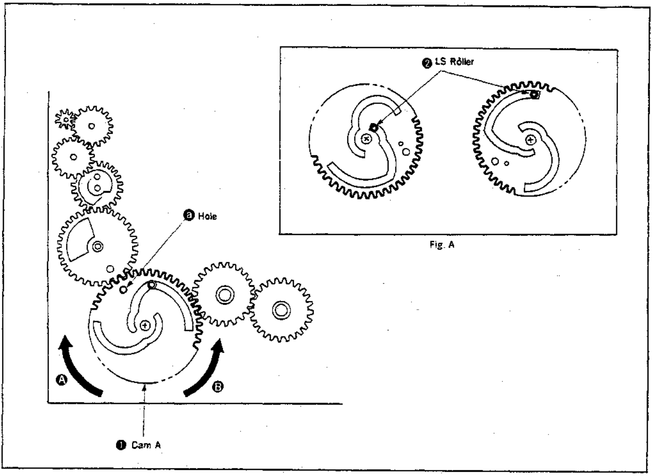


Fig. A

Fig. 37

3-17 LOADING MOTOR ASSEMBLY (Fig. 38)

1. Removal

1) Remove the LB-12 board.
2) Remove the connector ❶.
3) Remove the screws ❷ and ❸, and remove the loading motor assembly ❹ in an arrow direction.

2. Mounting

1) Put the pin ❺ of the loading motor assemmbly ❹ in the hole of the mechanical chassis, and mount it with the screws ❷ and ❸ in that order.
2) Mount the connector ❶.
3) Mount the LB-12 board.

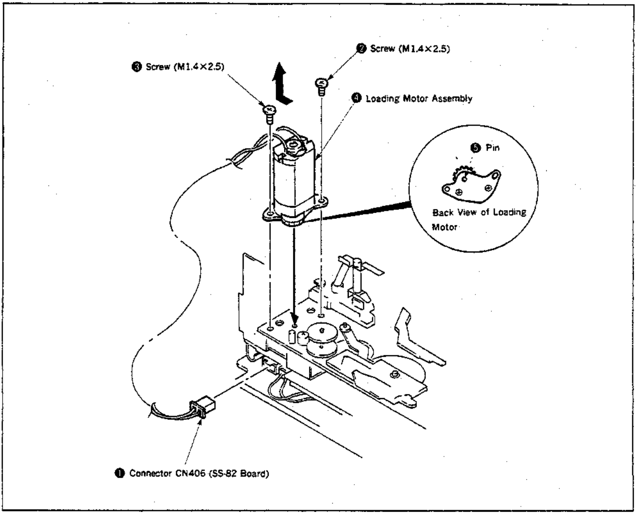

❷ Screw (M1.4×2.5)
❸ Screw (M1.4×2.5)
❹ Loading Motor Assembly
❺ Pin
Back View of Loading Motor
❶ Connector CN406 (SS-82 Board)

Fig. 38

3-18 GUIDE RAIL BASE 1 ASSEMBLY (Fig. 39)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Unskate the LS chassis a little.
3) Remove the two screws ❶, and then, guide rail base 1 assembly ❷.

Note : Be careful not to lose the spacers inserted in the parts ⓐ and ⓑ of the guide rail base 1 assembly ❷. (Fig. B)

2. Mounting

1) Apply half a drip each of molyton grease at 2 places on the back of the guide rail base 1 assembly. (Fig. A)
2) Put the pin ❸ of the guide rail base 1 assembly ❷ in the notch of the chassis, and tighten the two screws ❶ with a torgue of 0.6kg·cm.
3) Referring to 1-1, mount the cassette compartment holder assembly.

Note1 : Mount paying attention to the number of spacers inserted and their locations.

Note2 : When tightening the screws, be careful not to bend the TG-2 upper flange ❹ with a screwdriver bit.

Note3 : Note that the part c of the guide rail base 1 assembly is easily broken. (Fig. B)

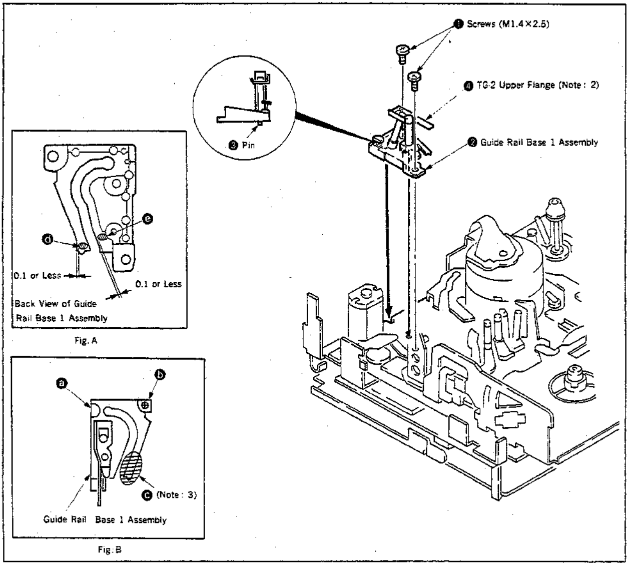

❶ Screws (M1.4×2.5)
❹ TG-2 Upper Flange (Note : 2)
❷ Guide Rail Base 1 Assembly
❸ Pin
ⓓ
ⓔ
0.1 or Less
0.1 or Less
Back View of Guide Rail Base 1 Assembly
ⓐ
ⓑ
ⓒ (Note : 3)
Guide Rail Base 1 Assembly

Fig. A

Fig. B

図39.

3-19 GUIDE RAIL BASE 2 ASSEMBLY (Fig. 40)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to the Service Manual, open the board in the back of the mechanical chassis.
3) Remove the four screws ❶, and then, frame B assembly ❷ in a direction of the arrow Ⓐ.
4) Unskate the LS chassis a little.
5) Remove the two screws ❸, and then, guide rail base 2 assembly ❹ in a direction of the arrow Ⓑ.

Note: Be careful not to hit the drum with a screwdriver bit because the screws are located closed to a drum lead.

2. Mounting

1) Apply half a drip of molyton grease each to 4 places on the back of the guide rail base 2 assembly. (Fig. A)
2) As shown in Fig. B, apply the striking parts of the guide rail base 2 assembly ❹ to the lower drum, and slide in an arrow direction to fit.
3) Pushing the part ※ of the guide rail base 2 assembly ❹ lightly in a direction of ⓔ (Fig. B), tighten the two screws ❸ with a torque of 0.8kg•cm.

Note: Note that the part f is easily broken.

4) Mount the frame B assembly with the four screws ❶.
5) Mount the opened board to the back of mechanical chassis.
6) Referring to 1-1, mount the cassette compartment holder assembly.

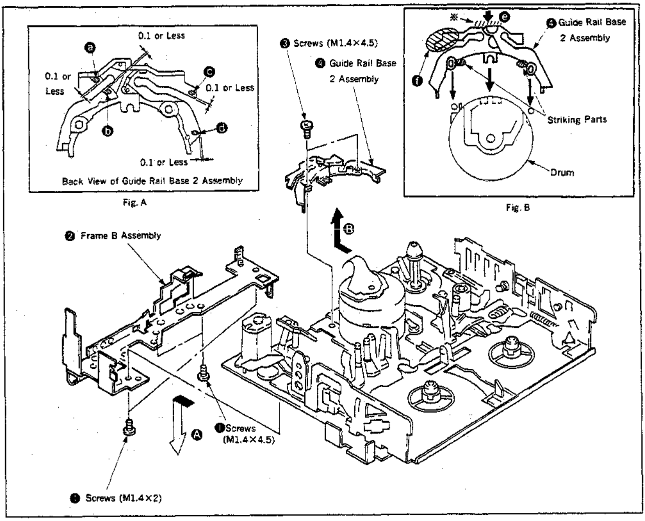

0.1 or Less
ⓐ
0.1 or Less
ⓒ
0.1 or Less
ⓑ
ⓓ
0.1 or Less
Back View of Guide Rail Base 2 Assembly
Fig. A
❸ Screws (M1.4×4.5)
❹ Guide Rail Base 2 Assembly
※
ⓔ
❹ Guide Rail Base 2 Assembly
ⓕ
Striking Parts
Drum
Fig. B
Ⓑ
❷ Frame B Assembly
Ⓐ
❶ Screws (M1.4×4.5)
❶ Screws (M1.4×2)

Fig. 40

3-20 GUIDE RAIL BASE 3 ASSEMBLY (Fig. 41)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Remove the flexible rotatry shaft ❸.
3) Remove the two screws ❶. Remove the guide rail base 3 assembly ❷ in an arrow direction, seeing to it that it does not hitch on the capstan housing.

Note : Handle the ✻ marked part carefully because it is easily broken.

2. Mounting

1) Apply half a drip of molyton grease each to 2 places on the back of the guide rail base 3 assembly ❷. (Fig. A)
2) Mount the guide rail base 3 assembly ❷, seeing to it that it does not hitch on the capstan housing.
3) Tighten the two screws ❶ with a torque of 0.6kg·cm.
4) Mount the flexible rotary shaft ❸.
5) Referring to 1-1, mount the cassette compartment holder assembly.

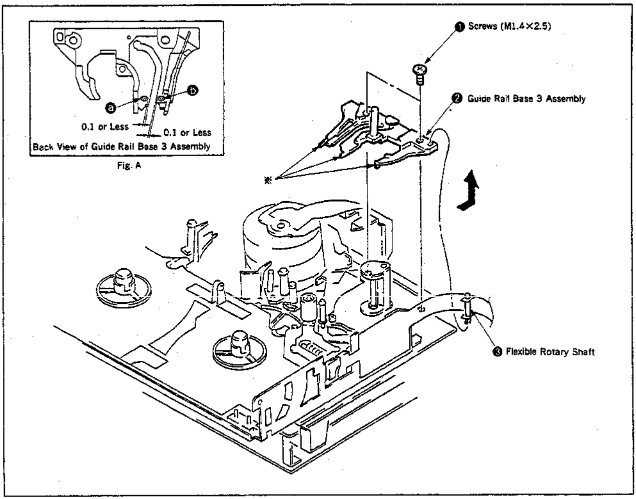

ⓑ
ⓐ
0.1 or Less
0.1 or Less
Back View of Guide Rail Base 3 Assembly
Fig. A
✻
❶ Screws (M1.4×2.5)
❷ Guide Rail Base 3 Assembly
❸ Flexible Rotary Shaft

Fig. 41

3-21 CAPSTAN MOTOR ASSEMBLY (Fig. 42)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-20, remove the guide rail base 3 assembly.
3) Remove the connector ❷ of the capstan motor assembly ❶.
4) Remove the screw ❸. Disengaging the gear of the conversion gear assembly ❹, remove the capstan motor assembly ❶ in an arrow direction (obliquely).

2. Mounting

1) As shown in Fig. A, incline the capstan motor assembly ❶ to engage the gear of the capstan motor assembly ❶ with that of the conversion gear assembly ❹, and tighten the screw 3 with a torque of 1kg•cm.
When this is done, be careful not to damage the gear of the conversion gear assembly ❹.
2) Mount the connector 2 to the capstan motor assembly ❶.
3) Referring to 3-20, mount the guide rail base 3 assembly.
4) Referring to 1-1, mount the cassette compartment holder assembly.

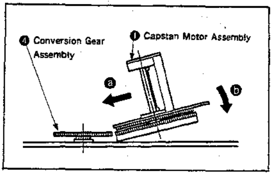

❹ Conversion Gear Assembly
❶ Capstan Motor Assembly
ⓐ
ⓑ

Fig. A

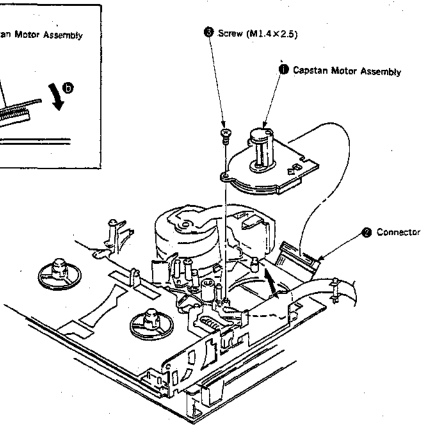

❸ Screw (M1.4×2.5)
❶ Capstan Motor Assembly
❷ Connector

Fig. 42

3-22 DRUM BASE ASSEMBLY (Fig. 42)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Remove the motor flexible board ❶ from the board.
3) Referring to 3-19, remove the guide rail base 2 assembly.
4) Remove the two screws ❷.
5) Draw out the head flexible board ❸ carefully from the hole of the mechanical chassis not to damage it, and remove the drum base assembly.

2. Mounting

1) Put the head flexible board ❸ in the hole of the mechanical chassis and put the positioning pins ❺ of the drum base in the holes of the mechanical chassis.
2) Tighten the two screws ❷ with a torque of 0.8kg•cm.
3) Referring to 3-19, mount the guide rail base 2 assembly.
4) Mount the motor flexible board ❶ to the board.
5) Referring to 1-1, mount the cassette compartment holder assembly.

Note: After mounting, make tape path adjustment in Section 4.

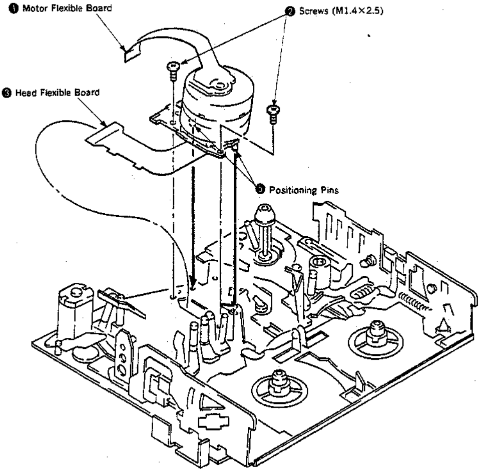


Fig. 42

3-23 DRUM ASSEMBLY (Fig. 43)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Remove the motor flexible board ❶ from the board.
3) Referring to 3-19, remove the guide rail base 2 assembly.
4) Remove the three screws ❷ from the back of the mechanical chassis.
5) Draw out the head flexible board ❸ carefully from the hole of the mechanical chassis not to damage it, and remove the drum assembly ❹.

2. Mounting

1) Put the head flexible board ❸ in the hole of the mechanical chassis, and mount it so that the pins ⓑ and ⓓ will be put in the holes ⓐ and ⓒ shown in Fig. A.
2) Tighten the three screws ❷ with a torque of 0.5kg•cm.
3) Referring to 3-19, mount the guide rail base 2 assembly.
4) Mount the motor flexible board ❶ to the board.
5) Referring to 1-1, mount the cassette compartment holder assembly.

Note : After mounting, make tape path adjustment in Section 4.

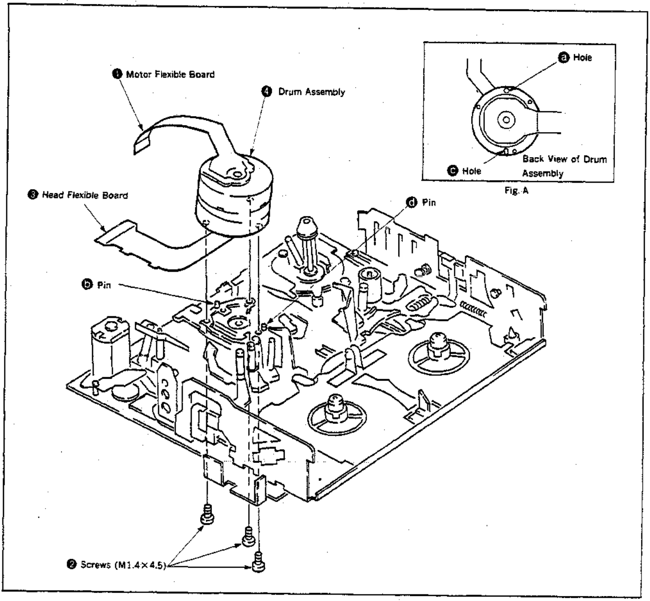
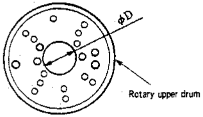

❶ Motor Flexible Board
❹ Drum Assembly
ⓐ Hole
ⓒ Hole
Back View of Drum Assembly
Fig. A
❸ Head Flexible Board
ⓓ Pin
ⓑ Pin
❷ Screws (M1.4×4.5)

Fig. 43

3-24 Replacement of Rotary Upper Drum Assembly

There are two rotary upper drum assembly types, depending on a color mark. (Fig. A in Fig. 45)



NTSC:

A-7049-190-A	Rotary upper drum assembly DGR-32-R-(1)
A-7049-189-A	Rotary upper drum assembly DGR-32-R-(2)

PAL:

A-7049-197-A	Rotary upper drum assembly DGR-37-R-(1)
A-7049-198-A	Rotary upper drum assembly DGR-37-R-(2)

Manufacturing upper dram

RANK	ϕD	MARK	
A	$\phi 8^{+0.0015}_{+0.001}$	Green	−01
B	$\phi 8^{+0.001}_{+0.0005}$	Green, Brown	
C	$\phi 8^{+0.0005}_{0}$	Black	
D	$\phi 8^{0}_{-0.0005}$	Black, Brown	
E	$\phi 8^{-0.0005}_{-0.001}$	Red	−11
F	$\phi 8^{-0.001}_{-0.0015}$	Red, Brown	
G	$\phi 8^{-0.0015}_{-0.002}$	Blue	
H	$\phi 8^{-0.002}_{-0.0025}$	Blue, Brown	

➡

Repairing upper drum

SUFFIX	ϕD	REMARKS	DRUM UPPER
−01	$\phi 8^{+0.001}_{+0.0005}$	Green, Brown	NTSC DGR-32-R-(1) PAL DGR-37-R-(1)
	$\phi 8^{+0.0005}_{0}$	Black	
−11	$\phi 8^{-0.001}_{-0.0015}$	Red, Brown	NTSC DGR-32-R-(2) PAL DGR-37-R-(2)
	$\phi 8^{-0.0015}_{-0.002}$	Blue	

1. Removal

1) Referring to 3-23, remove the drum assembly.
2) Remove the two screws ❶. (Fig. 44)
3) Hold the outlet (base) of the guide protector ❷, lift it up obliquely. In that state, hold the outer figure of the back yoke ❸ and remove it. (Fig. 44)

Note : Note that the flexible board and guide protector ❷ easily come off position because they are only pasted.

4) As shown in Fig. A, set the rotor earth spring ❹ around spring hook. (Fig. 44)
5) Using a drum screwdriver (Ref. No. J-11), remove the two hexagon socket bolts ❺, and then, rotary upper drum assembly ❻. (Fig. 45)
6) Using the drum screwdriver (Ref. No. J-11), remove the two hexagon socket bolts ❼, and then, rotor ❽. (Fig. A in Fig. 45)

2. Mounting

1) Clean the flange surface❿and the surface of the rotary upper drum assembly ❻ which comes into contact with it, and make sure that there is no dust or scratch. (Fig. 45)
2) Adjust a direction of the upper drum so that the head contact mold pin⓫will be put in the reference hole of the rotary upper drum assembly ❻, and push it in lightly. (Fig. 45)

Note : Check visually that the clearance between the upper and lower drums is about 0.05mm.

3) Using the drum screwdriver (Ref. No. J-11), tighten the two hexagon socket bolts ❺ (800g·cm) and rotate it with finger to make sure that there is no abnormality. (Fig. 45)
4) Put the pin ❾ of the rotor ❽ in the hole of the rotary upper drum assembly. Using the drum screwdriver (Ref. No. J-11), tighten the hexagon socket bolts ❼. (800g·cm) (Fig. A in Fig. 45)
5) Remove the rotor earth spring ❹ from the spring hook. Using tweezers, etc., hook it onto the groove of the stator boss⓬. (Fig. B in Fig. 45)

Note : See to it that the rotor earth spring ❹ is not located in the gap between the flange and stator.

6) Hold the outer figure of the back yoke ❸, put it on the inner step of the upper drum and insert the other side slowly. (Fig. B in Fig. 44)
7) Tighten the two screws ❶. (500g·cm) (Fig. 44)
8) Rotate the upper drum with finger to check that it runs smoothly.
9) Referring to 3-23, mount the drum assembly.

Note : After mounting, be sure to make tape path adjustment in Section 4.

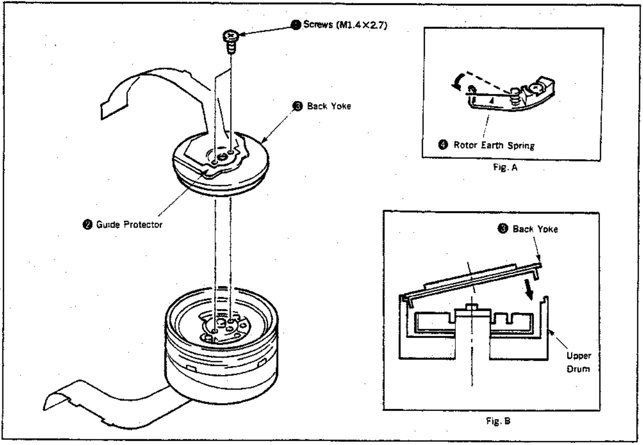

❶ Screws (M1.4×2.7)
❸ Back Yoke
❷ Guide Protector
❹ Rotor Earth Spring
Fig. A
❸ Back Yoke
Upper Drum
Fig. B

Fig. 44

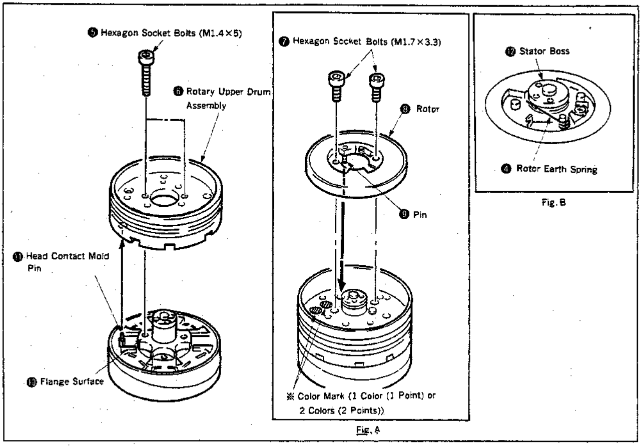

❺ Hexagon Socket Bolts (M1.4×5)
❻ Rotary Upper Drum Assembly
⓫ Head Contact Mold Pin
⓭ Flange Surface
❼ Hexagon Socket Bolts (M1.7×3.3)
❽ Rotor
❾ Pin
※ Color Mark (1 Color (1 Point) or 2 Colors (2 Points))
Fig. A
⓬ Stator Boss
❹ Rotor Earth Spring
Fig. B

Fig. 45

3-25 REEL TABLE HEIGHT CHECK (Fig. 46)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-1, remove the LED base.

2. Check

1) Using slide calipers, etc., check that distances from the LS chassis to the S reel table reel resting surface ❷ and T reel table reel resting surface ❸ are 3.2±0.5mm respectively.

3. Mounting

1) Referring to 3-1, mount the LED base.
2) Referring to 1-1, mount the cassette compartment holder assembly.

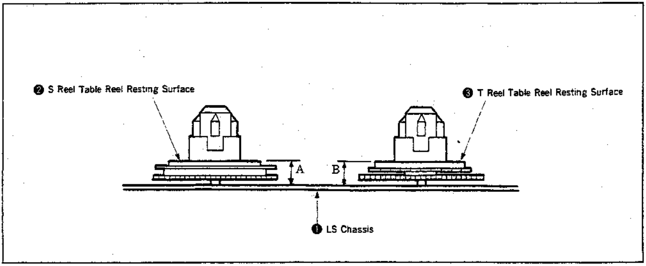

❷ S Reel Table Reel Resting Surface
❸ T Reel Table Reel Resting Surface
A
B
❶ LS Chassis

Fig. 46

3-26 FWD/RVS TORQUE CHECK

1) Set the FWD/RVS take-up torque cassette (Ref. No. J-10).
2) In the FWD mode, check that a T reel torque value is 6g•cm – 16g•cm.
3) Turn on the REC/REVIEW button and check that an S reel torque value is 25g•cm – 45g•cm.
4) When the values above are not met, replace the respective reel tables.

3-27 TENSION REGULATOR POSITION ADJUSTMENT

1. Removal

1) Referring to 1-1, remove the cassette compartment holder.

2. Adjustment

1) Set a cassette tape, select the REC mode and run the tape. (Refer to 1-3)
2) With the tape running, check that the distance between TG-1 and TG-2 is 9.58±0.2mm. (Fig. 47)
3) When they are not at specified positions, remove the cassette and go through the steps 4) on.
4) Referring to 3-1, remove the LED base.
5) Loosen the screw ❶.
6) When TG-1 is located inside (or outside) its specified position, shift the TG-1 adjustment block 2 slightly in a direction of the arrow Ⓐ (or Ⓑ) and fix with the screw ❶. (Fig. 48)
7) Referring to 3-1, mount the LED base.

Note : Use the cassette tape after feeding the tape as far as a middle point.

Note : When taking the steps 4) and 5), remove the cassette tape first.

3. Mounting

1) Referring to 1-1, mount the cassette compartment holder assembly.

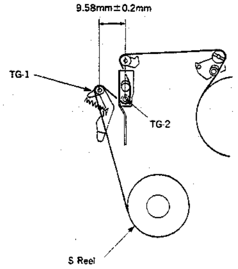


Fig. 47

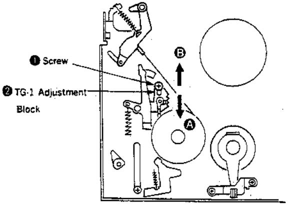


Fig. 48

3-28 FWD BACK TENSION ADJUSTMENT (Fig. 49)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-7, remove the LED base.

2. Adjustment

1) Select the REC mode.
2) Set the tension measurement reel (Ref. No. J-8)❶.
3) Using the dial tension gauge (Ref. No. J-7)❷, measure a tape tension at the outlet of TG-2. When this is done, pull the tape at a rate of 14mm/sec.
4) Change the position of the tention regulator spring ❸ position as shown in Fig. A so that measure center value of the tention is 4.5g–6.5g.

Note : When this is done, see to it that the gear ❹ is not engaged with the S reel table.

3. Mounting

1) Referring to 1-1, mount the cassette compartment holder assembly.
2) Referring to 3-1, mount the LED base.

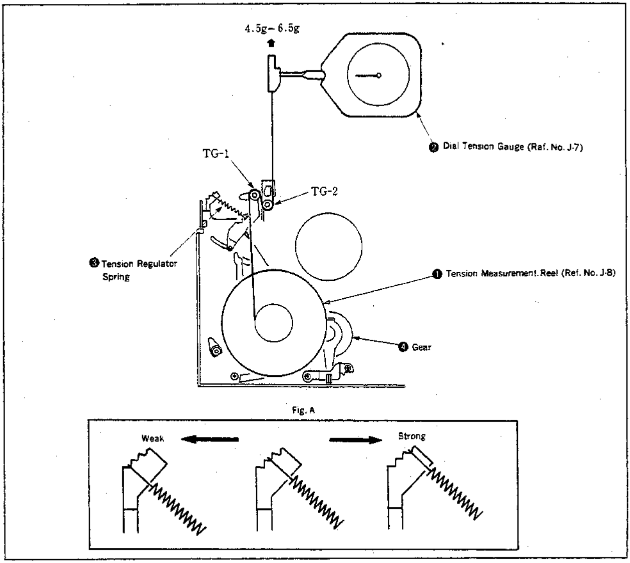

4.5g～6.5g
❷ Dial Tension Gauge (Raf. No. J-7)
TG-1
TG-2
❸ Tension Regulator Spring
❶ Tension Measurement Reel (Ref. No. J-8)
❹ Gear
Fig. A
Weak
Strong

Fig. 49

4. TAPE PATH ADJUSTMENT

The 8mm video system uses ATF (Automatic Track Finding) which instantaneously controls a tape running speed based on 4 types of pilot signals and performs high-precision tracking.

This does away a tracking control knob and allows accurate track tracing.

On the other hand, however, the ATF system has a problem in adjusting the tape path system. That is, if head tracing is out of order a little, the ATF system automatically corrects it, which means that perfect adjustment cannot be done.

To avoid this problem, a track shift jig had been used to adjust the tape path system. In the FL (Q) mechanism, the ATF system is forcibly operated to shift a tracking amount constantly (approx. 1/4) by setting the PATH mode. So, fine tracking adjustment can be easily done.

No track shift jig is required any more.

Example) For CCD-V11/V88

CN404

4	GND
3	$\overline{\text{CAM ADJ}}$
2	$\overline{\text{TEST}}$
1	$\overline{\text{PATH}}$

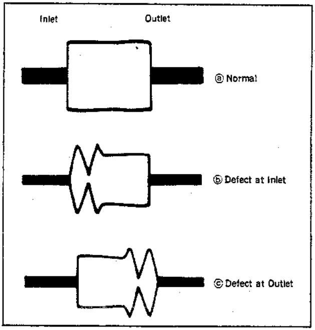
The path mode is set by shorting the pins ① and ④.

4-1 PREPARATION FOR ADJUSTMENT

1) Clean the tape running surfaces (tape guides, drum, capstan shaft, pinch roller). (Fig. 51)
2) Set the PATH mode by shorting the TEST pins (CN404 pins ① and ④ for CCD-V11/V88).
3) Connect to an oscilloscope.
4) Play back a tracking alignment tape (NTSC: WR5-1N). (PAL: WR5-1C).
5) Check that a RF waveform is flat at the inlet and outlet of the oscilloscope. (Fig. 50 ⓐ)

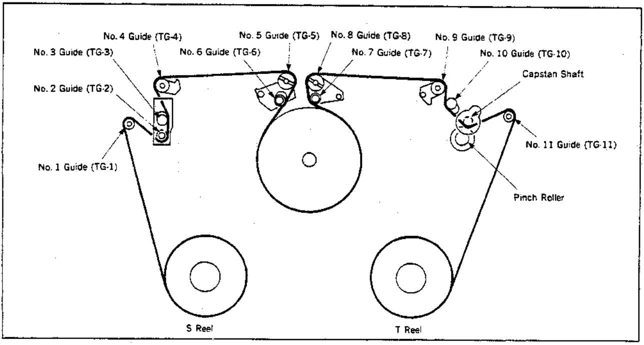
   When it is not flat, make adjustment in accordance with the procedures below.

   When the RF waveform is not flat at the inlet/outlet ; (Fig.50 ⓑ and ⓒ)



Inlet
Outlet
ⓐ Normal
ⓑ Defect at Inlet
ⓒ Defect at Outlet

Fig. 50



No. 4 Guide (TG-4)
No. 5 Guide (TG-5)
No. 8 Guide (TG-8)
No. 9 Guide (TG-9)
No. 3 Guide (TG-3)
No. 6 Guide (TG-6)
No. 7 Guide (TG-7)
No. 10 Guide (TG-10)
Capstan Shaft
No. 2 Guide (TG-2)
No. 11 Guide (TG-11)
No. 1 Guide (TG-1)
Pinch Roller
S Reel
T Reel

Fig. 51 Tape Guides Location

4-2 TRACKING ADJUSTMENT (Fig. 52)

1) Play back the tracking alignment tape.
2) Loosen the No. 5 guide (TG-5) lock screw ❶ and turn the No. 5 guide to flatten the waveform at the inlet.
3) Tighten the No. 5 guide (TG-5) lock screw ❶ to lock the No. 5 guide.
4) Loosen the No. 8 guide (TG-8) lock screw ❷ and turn the No. 8 guide to flatten the waveform at the outlet.
5) Tighten the No. 8 guide (TG-8) lock screw ❷ to lock the No. 8 guide. When this is done, make sure that the waveform does not change at the outlet.

Note : Be careful not to loosen the lock screw too much because the guide is easily moved.

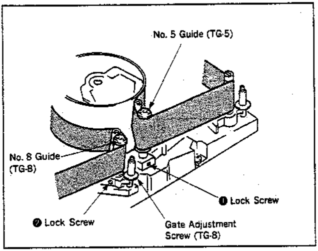


Fig. 52

4-3 NO. 4 GUIDE (TG-4) ADJUSTMENT

When an entire guide base is replaced, its height has been preste.

TG-4 Guide Height Presetting

1) With the top surface of the TG-4 guide leveled, rotate an upper flange by one turn. This is a preset height.

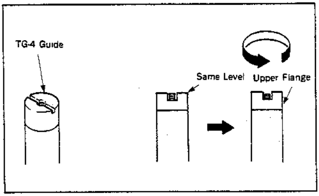


Fig. 53

No. 4 Guide (TG-4) Adjustment

1) Play back the tracking alignment tape.
2) In the FWD mode, check that the tape runs along a TG-4 lower flange. When there is a clearance, turn TG-4 counterclockwise to put the tape along the TG-4 lower flange. turning angle must be within 180°.
When this is done, check that a tracking waveform (Fig. 54) is not changed.
When a tracking waveform inlet is downward as shown in Fig. 55, make tracking adjustment at the inlet side by raising a height of TG-4.

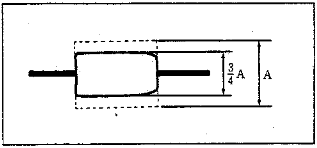


Fig. 54

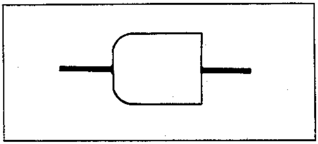


Fig. 55

Tape Path Adjustment for "Guide Rail Base 1 with TG4 Gate Adjustment" (Fig. 56)

After adjusting an inlet, when the TG-4 lower flange is curled in the REV mode, turn the TG-4 gate adjusting screw at pitches of 45° to the left to remove a curl. (A lock screw is attached to the TG-4 gate adjusting screw. First, loosen the lock screw a little, and then, turn the gate adjusting screw After adjustment, tighten the lock screw.)

If the TG-4 gate adjusting screw is turned to the left too much, the TG-3 upper flange (arrow-indicated part in the figure above) is greatly curled. If it happens, turn the screw to the right.

Tape path Adjustment for "Guide Rail Base 2 with TG8 Gate Adjustment"

You do not have to adjust theTG-8 gate adjustment screw.

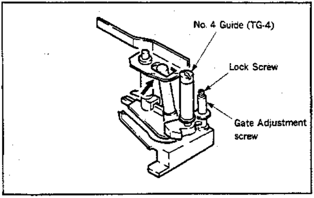


Fig. 56

4-4 NO. 11 GUIDE (TG-11) ADJUSTMENT

1) In the PLAY BACK mode, check that it has no deflection between the capstan and No. 11 guide (TG-11).
(Criterion: 0.5mm or less)
when the tape is deflected, turn the No. 11 guide (TG-11) to remove its deflection. (Fig. 57)
2) Select the REV mode and check the RF waveform at the outlet side. (Fig. 58)
3) If the waveform is defective, turn the TG-11 nut counterclockwise by 90° and recheck 2), 3) and 4).
4) Apply screw lock to the No. 11 guide (TG-11).

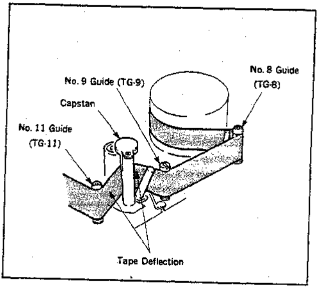

No. 9 Guide (TG-9)
No. 8 Guide
(TG-8)
Capstan
No. 11 Guide
(TG-11)
Tape Deflection

Fig. 57

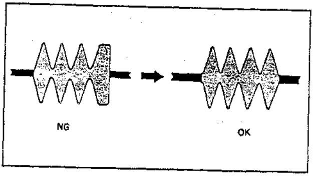


Fig. 58

4-5 CHECK AFTER ADJUSTMENT

1. Tracking Check

1) Play back the tracking alignment tape. In the PATH mode, shift a track. (Fig. 59)
2) At this time, check that a minimum amplitude value (E_{MIN}) is 67% or more of a maximum amplitude value (E_{MAX}). (Fig. 60)
3) Make sure that the waveform does not fluctuate greatly. (Fig. 61)

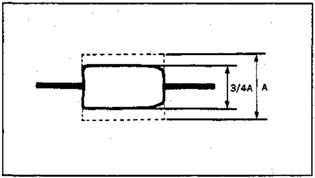


Fig. 59

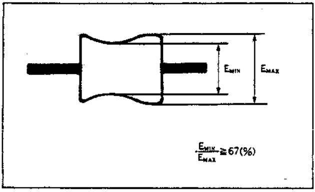


Fig. 60

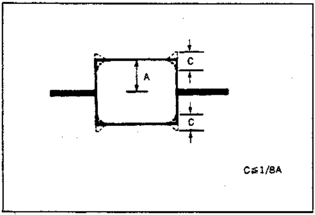


Fig. 61

2. CUE, REV Check

1) Play back the tracking alignment tape and select the REV mode. At this time, waveform peak pitches must be unform. (Fig. 62 ⓐ) When they not uniform, make tracking adjustment in 4-2 and No. 11 guide (TG-11) adjustment in 4-4.
2) Select the CUE mode. At this time waveform peak pitches must be uniform. (Fig. 62 ⓑ) When not uniform, make tracking adjustment in 4-2.

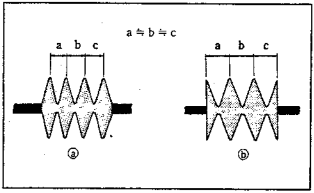


Fig. 62

3. Rise Check

1) Play back the tracking alignment tape.
2) In the PLAY BACK mode, check that the RF waveform rises horizontally within one second. At this time, check also that the tape is not deflected around the pinch roller. (Fig. 63)
3) Play back the tape after CUE/REV and FF/REW operation and check that the RF waveform rises horizontally within one second. At thistime, check also that the tape is not deflected around the pinch roller.
4) Repeat the checks in 2) and 3).

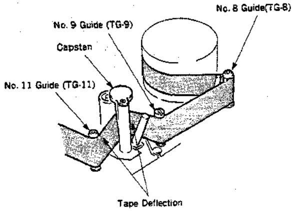

No. 8 Guide(TG-8)
No. 9 Guide (TG-9)
Capstan
No. 11 Guide (TG-11)
Tape Deflection

Fig. 63

4. Tape Running Check

In the CUE and REV modes, check that the TG-2 upper and lower flanges, TG-4 lower flange, TG-5 upper flange, TG-8 upper flange and TG-11 upper and lower flanges are not culed greatly. (Fig. 63)

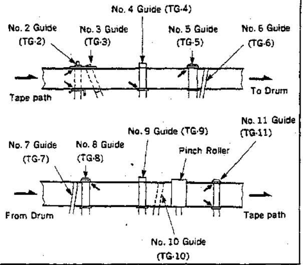

No. 4 Guide (TG-4)
No. 2 Guide (TG-2)
No. 3 Guide (TG-3)
No. 5 Guide (TG-5)
No. 6 Guide (TG-6)
Tape path
To Drum
No. 11 Guide (TG-11)
No. 9 Guide (TG-9)
No. 7 Guide (TG-7)
No. 8 Guide (TG-8)
Pinch Roller
From Drum
Tape path
No. 10 Guide (TG-10)

Fig. 64

8mm Video MECHANICAL ADJUSTMENT MANUAL II

FL MECHANISM (Q MECHANISM) Video 8

SUPPLEMENT-1

File this supplement with the service manual.

The adjustment values in the following sections have been changed. We inform you of these changed values as conditions no longer meet.

Page 39. 3-25 REEL TABLE HEIGHT CHECK.
Page 39. 3-26 FWD / RVS TORQUE CHECK.
Page 40. 3-27 TENSION REGULATOR POSITION ADJUSTMENT.
Page 41. 3-28 FWD BACK TENSION ADJUSTMENT.

8 VIDEO RECORDER
SONY®

(Page 39.)

3-25 REEL TABLE HEIGHT CHECK (Fig. 46)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-1, remove the LED base.

2. Check

1) Using slide calipers, etc., check that distances from the LS chassis to the S reel table reel resting surface ❷ and T reel table reel resting surface ❸ are ~~3.2±0.5mm~~ respectively.

3. Mounting

1) Referring to 3-1, mount the LED base.
2) Referring to 1-1, mount the cassette compartment holder assembly.

changed values

A: $3.2^{+0.2}_{-0.15}$mm
B: 3.2±0.15mm

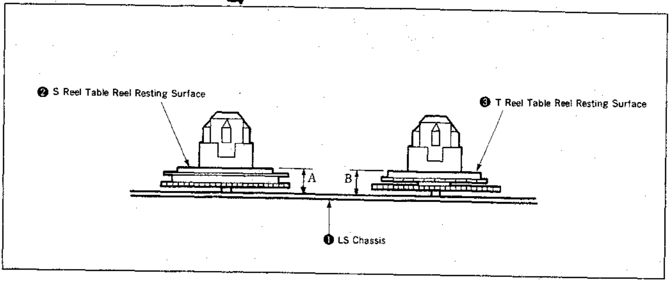

❷ S Reel Table Reel Resting Surface
❸ T Reel Table Reel Resting Surface
A
B
❶ LS Chassis

Fig. 46

3-26 FWD/RVS TORQUE CHECK

1) Set the FWD/RVS take-up torque cassette (Ref. No. J-10).
2) In the FWD mode, check that a T reel torque value is ~~6g·cm — 16g·cm.~~ **changed value** 5 – 15g·cm.
3) Turn on the REC/REVIEW button and check that an S reel torque value is 25g·cm — 45g·cm.
4) When the values above are not met, replace the respective reel tables.

(Page 40.)

3-27 TENSION REGULATOR POSITION ADJUSTMENT

1. Removal

1) Referring to 1-1, remove the cassette compartment holder.

2. Adjustment

1) Set a cassette tape, select the REC mode and run the tape. (Refer to 1-3)
2) With the tape running, check that the distance between TG-1 and TG-2 is ~~9.58±0.2mm.~~ (Fig. 47)
3) When they are not at specified positions, remove the cassette and go through the steps 4) on.

changed value

9.35 – 10.7mm.

4) Referring to 3-1, remove the LED base.
5) Loosen the screw ❶.
6) When TG-1 is located inside (or outside) its specified position, shift the TG-1 adjustment block 2 slightly in a direction of the arrow Ⓐ (or Ⓑ) and fix with the screw ❶. (Fig. 48)
7) Referring to 3-1, mount the LED base.

Note : Use the cassette tape after feeding the tape as far as a middle point.

Note : When taking the steps 4) and 5), remove the cassette tape first.

Note : Check that TG1 is able to move in direction C during REC.

3. Mounting

1) Referring to 1-1, mount the cassette compartment holder assembly.

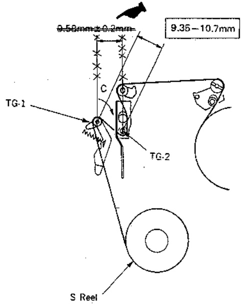


Fig. 47

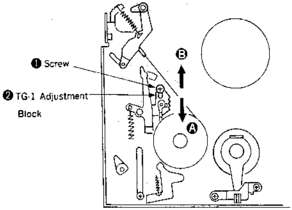


Fig. 48

(Page 41.)

3-28 FWD BACK TENSION ADJUSTMENT (Fig. 49)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-7, remove the LED base.

2. Adjustment

1) Select the REC mode.
2) Set the tension measurement reel (Ref. No. J-8)❶.
3) Using the dial tension gauge (Ref. No. J-7)❷, measure a tape tension at the outlet of TG-2. When this is done, pull the tape at a rate of 14mm/sec.
4) Change the position of the tention regulator spring ❸ position as shown in Fig. A so that measure center value of the tention is ~~4.5g–6.5g.~~ **changed value** 4–6.5g.

Note : When this is done, see to it that the gear ❹ is not engaged with the S reel table.

3. Mounting

1) Referring to 1-1, mount the cassette compartment holder assembly.
2) Referring to 3-1, mount the LED base.

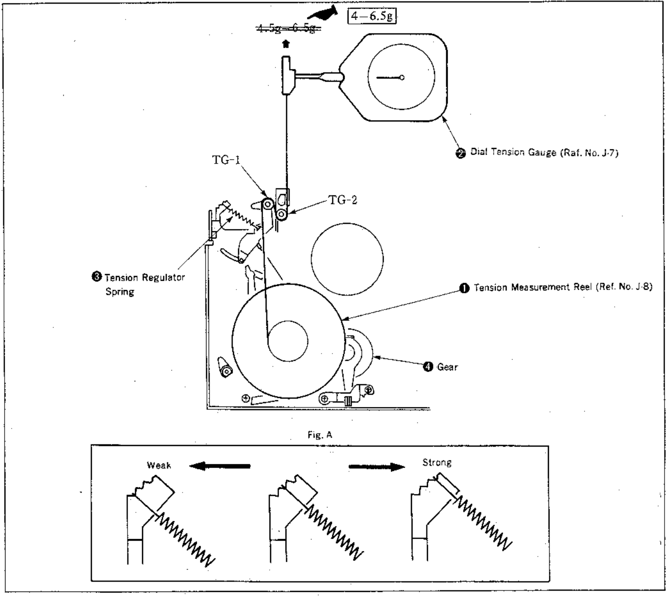

4–6.5g
~~4.5g–6.5g~~
❷ Dial Tension Gauge (Raf. No. J-7)
TG-1
TG-2
❸ Tension Regulator Spring
❶ Tension Measurement Reel (Ref. No. J-8)
❹ Gear
Fig. A
Weak
Strong

Fig. 49

English
92E0694-1

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8mm Video MECHANICAL ADJUSTMENT MANUAL II

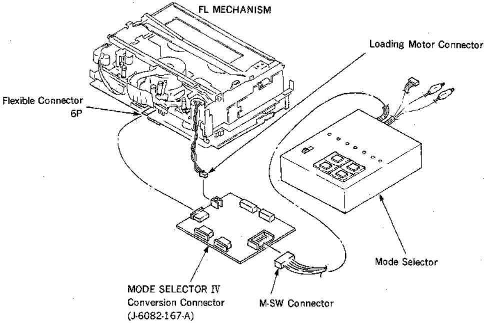
Video 8

FL MECHANISM (Q MECHANISM)

SUPPLIMENT-2

<Connection of Mode Selector IV Conversion Connector>

When using the mode selector IV conversion connector (J-6082-167-A) in the FL mechanism, it is connected as shown below.


FL MECHANISM
Loading Motor Connector
Flexible Connector 6P
Mode Selector
MODE SELECTOR IV Conversion Connector (J-6082-167-A)
M-SW Connector

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